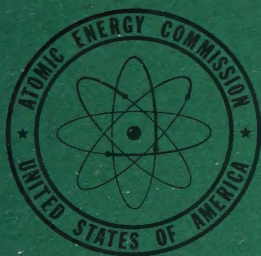


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AUTHOR INDEX

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

- AARON DAVID
6-1173
- ABBOTT T A
6-485
- ABRAGAM A
6-1300 6-1847
- ACCARY A
6-1156
- ACCOUNTIUS OLIVER E
6-208
- ACHERMAN W L
6-1236
- ACKERLIND C J
6-596
- ADAMS THOMAS J
6-1635
- ADAMSON ARTHUR W
6-87 6-139 6-1123
- ADER MARIE
6-1292
- ADLAM J H
6-1493
- AEPPLI H
6-347 6-417
- AERONAUTICAL RESEARCH
CONSULTATIVE COMMITTEE
AUSTRALIA
6-1624
- AHEARN A J
6-957
- AHMED A A
6-1049
- AHRLAND STEN
6-1434
- AITKEN P B
6-423
- AJZENBERG FAY
6-536
- ALBANSKII V L
6-114
- ALBERS-SCHONBERG H
6-347
- ALBERT PHILIPPE
6-549
- ALBRIGHT CHARLES H
6-538
- ALBURGER DAVID E
6-1530
- ALDER KURT
6-346
- ALEXANDER B H
6-603 6-1474
- ALEXANDER GEORGE V
6-69 6-70 6-158
- ALFRED UNIV
6-199
- ALLARD GERARD A
6-1342 6-1572 6-1908
- ALLEN AUGUSTINE O
6-1678
- ALLEN BENNET M
6-36
- ALLEN JAMES S
6-1909
- ALLEN K W
6-1886
- ALLEN ROBERT C
6-1878
- ALLEN S
6-618 6-1470
- ALLIS W P
6-1768
- ALLRED V DEAN
6-1426
- ALMQVIST E
6-1886
- ALPHER RALPH A
6-1755
- ALTER H W
6-1130
- ALTLAND PAUL D
6-1090
- ALVAREZ L W
6-1818
- AMALDI E
6-1818
- AMES LAB
6-86 6-157 6-256
6-275 6-276 6-539
- AMES LAB
6-558 6-559 6-560
6-561 6-562 6-563
6-573 6-735 6-839
6-840 6-1028 6-1119
6-1171 6-1226 6-1464
6-1504 6-1531 6-1572
6-1629 6-1553 6-1858
- AMHERST COLL
6-1425
- ANDEM W R
6-1600
- ANDERSON E G
6-774
- ANDERSON G W
6-1266
- ANDERSON H C
6-1570
- ANDERSON H L
6-1818
- ANDERSON L C
6-916
- ANDERSON MARGARET E
6-852
- ANDERSON R A
6-231
- ANDERSON R CHRISTIAN
6-104
- ANDERSON WENDELL L
6-517
- ANGER H O
6-521 6-1813
- ANJANSSON G
6-176
- ANTHONY D S
6-532
- ARAKI GENTARO
6-748
- ARAMBOURG CAMILLE
6-1461
- ARCAND G M
6-1682
- ARCE R
6-923
- ARFKEN G B
6-339 6-1844
- ARGONNE NATIONAL LAB
6-28 6-77 6-78
6-125 6-163 6-164
6-225 6-381 6-405
6-500 6-501 6-502
6-506 6-520 6-526
6-556 6-568 6-625
6-640 6-679 6-698
6-763 6-784 6-863
6-958 6-1046 6-1047
6-1048 6-1082 6-1083
6-1084 6-1135 6-1176
6-1260 6-1286 6-1287
6-1387 6-1414 6-1415
6-1422 6-1427 6-1428
6-1506 6-1527 6-1608
6-1609 6-1615 6-1616
6-1677 6-1694 6-1798
6-1829 6-1838 6-1906
- ARKANSAS UNIV
6-1134
- ARMENTEROS R
6-264
- ARMOUR RESEARCH
FOUNDATION
6-591 6-504 6-902
6-1498
- ARMY MEDICAL RESEARCH
LAB FORT KNOX
6-31 6-62 6-1075
- ARNER W J
6-1419
- ARNOLD J T
6-1671
- ARNOLD W A
6-484
- ARNOLD W R
6-955
- ARNSTEIN H R V
6-571
- ARONOFF S
6-159 6-1704
- ARROL W J
6-151
- ARTOM CAMILLO
6-799 6-1081
- ASARO FRANK
6-415 6-1481
- ASLING C W
6-1389
- ASSET G M
6-183
- ATHERTON J E JR
6-1745
- ATKINSON D E
6-164
- ATKINSON J R
6-401
- ATOMIC ENERGY COMMISSION
6-1187 6-1318
- ATOMIC ENERGY PROJECT
CANADA
6-1494 6-1495 6-1508
6-1554 6-1802 6-1831
6-1854 6-1857
- ATOMIC ENERGY PROJECT
UNIV OF CALIF
6-508
- ATOMIC ENERGY PROJECT
UNIV OF CALIF
LOS ANGELES
6-12 6-13 6-35
6-36 6-37 6-69
6-70 6-158 6-765
6-1343 6-1380 6-1500
6-1600 6-1702
- ATOMIC ENERGY PROJECT
UNIV OF ROCHESTER
6-509 6-510 6-516
6-528 6-657
- ATOMIC ENERGY PROJECT
WESTERN RESERVE UNIV
6-1379
- ATOMIC ENERGY RESEARCH
ESTABLISHMENT HARWELL
BERKS ENGLAND
6-135 6-151 6-155
6-156 6-181 6-226
6-271 6-332 6-358
6-514 6-544 6-545
6-639 6-699 6-849
6-878 6-956 6-957
6-1003 6-1027 6-1185
6-1227 6-1228 6-1391
6-1423 6-1493 6-1505
6-1529
- AUSTING MARY E
6-31
- AVERBACH B L
6-595 6-598 6-618
6-1467 6-1470
- AVERY E
6-1798
- AXEL P
6-1052
- AXELROD-HELLER DOROTHY
6-1389
- AYANT YVES
6-341
- AZAM
6-880
- AZIMOV S A
6-263
- BACON G E
6-721 6-1161 6-1162
- BACQ Z M
6-51 6-1385
- BAER W H
6-596
- BAEYERTZ M
6-902
- BAGARYATSKII YU A
6-244
- BAGGE ERICH
6-982
- BAGGETT L M
6-1009
- BAILEY R V
6-185

NUCLEAR SCIENCE ABSTRACTS

BAINBRIDGE D W
6-1723
BAINBRIDGE KENNETH T
6-734
BAIR JOE KEASY
6-646 6-647 6-1535
BAKER H DEAN
6-627
BAKER HAYWARD R
6-1218
BAKER W H
6-645
BAKER W R
6-476 6-486 6-1585
BAKER WILLIAM B
6-647
BAKISH R
6-600 6-1238
BAKKER C J
6-420 6-422
BALDINGER E
6-314 6-402 6-1018
6-1861 6-1895
BALDWIN ROBERT
6-163
BALES P D
6-183
BALIS M EARL
6-1112
BALLUFFI R W
6-603 6-1474
BAME S J JR
6-1009
BANDTEL KENNETH C
6-323
BANKS C V
6-157
BANNERMAN R C
6-307
BANNING FLOYD H
6-1727
BARBER A J
6-1422
BARBERA RICHARD
6-69
BARCLAY F R
6-1851
BARENDREGT F
6-437
BARET C
6-1699
BARINSKII R L
6-138
BARKAS WALTER H
6-298 6-319 6-320
6-322 6-378 6-390
6-656 6-1512 6-1515
BARKER C C
6-819
BARKER K H
6-264
BARKLEY LLOYD B
6-91
BARNES BENJAMIN FRANKLIN
6-1170
BARNES S W
6-1883
BARNETT C F
6-1549
BARNHART W S
6-465
BAROODY E M
6-498
BARRER R M
6-190
BARRERE GILBERT
6-1290
BARRON E S GUZMAN
6-1084
BARSCALL H H
6-1503 6-1860
BARTON J C
6-614
BARUCH PIERRE
6-1642
BASKOVA K A
6-395
BASSHAM J A
6-167
BASTIN-SCOFFIER G
6-428
BASU D
6-729
BATDORF S B
6-899
BATES L M
6-1102
BATTLE MEMORIAL INST
6-227 6-273 6-684
6-898 6-915 6-1377
6-1732 6-1736
BAUER F K
6-1087
BAUER H L JR
6-1457

BAY Z
6-1839
BAYER LISEL
6-847
BEAMISH F E
6-1686
BEATTY ALVIN V
6-24 6-26
BEATTY K O JR
6-1446
BEAUGE R
6-696
BEAUMONT R H JR
6-1656
BECK CLIFFORD
6-1194
BECK PAUL A
6-1242 6-1245
BECKER G
6-1309
BECKER JOSEF
6-1107
BECKER ROBERT A
6-279
BEEBE R A
6-1425
BEHRENS C F
6-1376
BELINFANTE FREDERIK J
6-744 6-1054 6-1056
6-1057
BELING JOHN K
6-1523
BELL P R
6-533 6-1511
BELL R E
6-426 6-1839
BELYAEV I N
6-207
BENDICH AARON
6-366
BENE GEORGES J
6-1307
BENEDICT JOSEPH T
6-1173
BENEDICT MANSON
6-1282
BENNETT EDWARD L
6-850
BENOIST GUEUTAL P
6-977
BENSEY FRANK N
6-617
BENSON A A
6-167 6-168 6-531
BENSON JOHN A JR
6-7
BENTE D
6-66
BENTLEY RONALD
6-571
BERESTETSKII V B
6-326
BERG MARVIN
6-33
BERGER L B
6-126
BERGMAN A G
6-96
BERLIN T H
6-688
BERMAN ARTHUR I
6-191 6-334 6-937
6-1778
BERNARDINI G
6-672 6-1818
BERNAS RENE
6-636
BERNHEIM FREDERICK
6-1590
BERNSTEIN HAROLD
6-250
BERNSTEIN W
6-1507
BERTRAND DIDIER
6-16 6-17
BETHE H A
6-1819 6-1937
BEVER M B
6-1471
BEWICK H A
6-1686
BEWLEY D K
6-404
BHABHA H J
6-1562
BHATTACHARYA P C
6-1757
BIEDENHARN L C
6-339 6-1844
BIGELEY JACOB
6-1118 6-1792
BIGELOW J E
6-1581

BIGELOW R R
6-1599
BILLEN DANIEL
6-29 6-47 6-1079
BILLINGS MARTA S
6-35
BIRGE ANN C
6-737
BIRGE ROBERT W
6-299 6-1512
BIRGER N G
6-1270
BIRKS J B
6-306
BIRNBAUM W
6-320
BISHOP A S
6-347
BISHOP F W
6-1500
BISWAS S
6-611
BLACK ARTHUR L
6-796
BLACKBURN PAUL E
6-88
BLACKMAN M
6-1274
BLAIR HENRY A
6-509 6-510 6-516
6-657
BLAKE C A
6-180
BLASER J P
6-1021 6-1022
BLAUM M
6-642
BLEARS J
6-583 6-585
BLIZARD E P
6-1360
BLOMEKE J O
6-147
BLOOMFIELD J R
6-1606
BLUM J M
6-1295
BLUMENTHAL H
6-120
BLUMKIN S
6-1158
BLUNCK O
6-1889 6-1890 6-1891
BODE HANS
6-829
BOEHM F
6-1021 6-1022
BOELTER L M K
6-1191
BOERSCH H
6-1208 6-1210
BOGAARDT MAARTEN
6-396 6-399
BOGANIK N S
6-425
BOHLANDER A
6-56
BOHLANDER ADAM
6-1383
BOKSENBOM AARON S
6-860
BOLEY FORREST I
6-735
BOLGIANO P
6-688
BOLLMANN W
6-1007
BOLTAKS B I
6-206
BOLTZ D F
6-1405
BOMMEL H
6-1884
BONANOMI J
6-302
BOND V P
6-23
BONDI A
6-127
BONET-MAURY B
6-1603
BONFIGLIOLI GUIDO
6-668
BONILLA C F
6-579
BONNER T W
6-1859
BONNET L
6-886
BONNIER G
6-773
BOORSE H A
6-1280
BORG W A J
6-73

AUTHOR INDEX

BORGSTROM BENGT
6-1408

BORREL MARCEL
6-1141

BORST L B
6-1754 6-1860

BOSLEY W
6-1550

BOTH E
6-785

BOTHNER-BY AKSEL A
6-104

BOTKIN A L
6-31 6-1075

BOUCHEZ ROBERT
6-1941

BOULLE ANDRE
6-456

BOWE J C
6-1052

BOWEN D
6-115

BOWEN VAUGHAN T
6-503 6-1114

BOWMAN GRAY SCHOOL
OF MEDICINE
WAKE FOREST COLL
6-1081

BOYAR R E
6-1527

BOYD CHARLES A
6-286

BOYD G E
6-1420

BRACE LAB OF PHYSICS
UNIV OF NEBRASKA
6-1528

BRADDICK H J J
6-257

BRADEN C H
6-1033 6-1040

BRADFORD R S
6-348 6-1418

BRADLEY A J
6-827

BRADLEY L C
6-743 6-1930

BRADY E L
6-731

BRADY ROSCOE O
6-173 6-174

BRANDT R A
6-1174

BRANDSEN B H
6-720

BRANYAN C E
6-739

BRATCHER L MARTEL
6-1316

BRAUNER A R
6-665

BREIT G
6-724 6-1832 6-1887
6-1893 6-1894

BREITENSTEIN JOHN S
6-911

BRESLIN A J
6-788

BRETON D
6-697

BRETSCHER E
6-1859 6-1860

BRETTON R H
6-1552

BREVOORT MAURICE J
6-865

BREWSTER DWAIN A
6-1140

BRICK R M
6-229

BRICKER C E
6-1400 6-1555

BRINKWORTH M J
6-371 6-1003

BRISTEAU P
6-1789

BRITISH ALUMINIUM CO LTD
LONDON ENGLAND
6-904

BRITTEN R J
6-1794

BRIX PETER
6-693

BROBECK W
6-1481

BRODA E
6-663

BROMBERG A V
6-95

BROMLEY LEROY A
6-254

BRONSON JOHN F
6-877

BROOKHAVEN NATIONAL LAB
6-85 6-103 6-104
6-165 6-224 6-292
6-315 6-316 6-336
6-383 6-406 6-443
6-492 6-503 6-507
6-546 6-551 6-572
6-626 6-641 6-642
6-733 6-734 6-780
6-1086 6-1114 6-1115
6-1118 6-1165 6-1166
6-1182 6-1283 6-1315
6-1340 6-1373 6-1374
6-1388 6-1399 6-1463
6-1507 6-1525 6-1530
6-1544 6-1552 6-1553
6-1595 6-1628 6-1652
6-1678 6-1706 6-1746
6-1747 6-1792 6-1816
6-1817 6-1928

BROPHY GERALD P
6-1223

BROSI A R
6-435 6-436

BROUWER G P
6-300

BROWN A F
6-1258

BROWN FRANK H JR
6-209

BROWN FREDERICK C
6-1760

BROWN GEORGE BOSWORTH
6-1112 6-1178

BROWN H S
6-1754

BROWN K B
6-180

BROWN MARY B
6-1382

BROWN SANBORN C
6-1490 6-1768

BROWN STEWART A
6-1618

BROWN W G
6-1176

BROWNE C I
6-413

BROWNELL GORDON L
6-654

BROWNELL L E
6-916

BROWNING W E
6-1316

BRUES AUSTIN M
6-500 6-501 6-506
6-520 6-526 6-568
6-625 6-640 6-763

BRUN EDMOND
6-1717

BRYANT L W
6-675

BRYSK HENRY
6-431

BUCHANAN DONALD L
6-1387 6-1509

BUCK THOMAS M JR
6-1480

BUCKALOO G WARREN
6-659 6-1378

BUECHE A M
6-1413

BUILDING MATERIALS
RESEARCH LAB
MASS INST OF TECH
6-1437

BULLOCK M LOREN
6-1011

BUMILLER H
6-522

BUNGE MARIO
6-1060

BURBANK ROBINSON D
6-617

BUREAU OF MINES
6-126 6-862 6-1229
6-1627 6-1727

BUREAU OF MINES
BLUEMONT VA
6-1401

BURFORD W B III
6-1570

BURGE E J
6-1869

BURGY M T
6-381 6-1903

BURKART M W
6-500 6-1238

BURKE A W JR
6-1093

BURKE T G
6-1668

BURLING RICHARD L
6-922

BURLINGAME LOUISE
6-35

BURNETT W T JR
6-49 6-776 6-1080
6-1093

BURR JOHN G JR
6-175 6-179

BURRIS P H
6-71

BURROW J H
6-1A04

BURROWS H B
6-1328 6-1329 6-1330
6-1A69

BURSON S B
6-1046 6-1907

BURTON MILTON
6-1676

BUSCH J S
6-579

BUSHKOVITCH A V
6-954

BUTLER C C
6-264

BUTLER EDWARD E
6-1073 6-1085

BUTLER T A
6-559

BUTTLAR H V
6-1A09

BUTTON J C E
6-195

BUYLE-BODIN MAURICE
6-692

BYERRUM RICHARD U
6-1618

CACHON A
6-264

CADY G H
6-464

CAGLE CHARLES D
6-781

CAHEN L
6-220 6-221 6-222

CAHN R W
6-226

CALIFORNIA INST OF TECH
6-233

CALIFORNIA UNIV
LOS ANGELES
6-1191

CALIFORNIA UNIV
SCHOOL OF MEDICINE
6-1617

CALNAN E A
6-1478

CALVIN MELVIN
6-14 6-75 6-167
6-817 6-831 6-832
6-854

CAMERINI U
6-259

CAMERON A 3 W
6-365 6-1871 6-1876

CAMPBELL C G
6-1557

CAMPBELL E C
6-1499

CAMPBELL I G
6-1088

CAMPBELL IRA L
6-1612

CANCER RESEARCH INST
NEW ENGLAND DEACONESS
HOSPITAL
6-779

CANDLER C
6-684

CANISIUS COLL
6-1674

CARBIDE AND CARBON
CHEMICALS CO K-25
6-354 6-617 6-855
6-1663

CARBIDE AND CARBON
CHEMICALS CO Y-12
6-110 6-449 6-905

CARLSON B C
6-1794

CARLSON J GORDON
6-5 6-43

CARLSON RICHARD R
6-1016

CARLSON THOMAS
6-1509

CARNEGIE INST OF TECH
6-224 6-597 6-1153
6-1154 6-1155 6-1544
6-1660 6-1771 6-1910

CARON MICHEL
6-549

NUCLEAR SCIENCE ABSTRACTS

CARPENTER ARTHUR
6- 62
CARPENTER J E
6- 936
CARROL BENJAMIN
6-1019
CARSON S F
6- 178 6- 532 6-1070
6-1620 6-1697
CARSON W N JR
6- 196
CARTER J C
6- A63
CARTER S M
6-1033
CASATI ANNIBALE
6-1605
CASE INST OF TECH
6- 680
CASSELS J M
6-1859 6-1887
CASSEN BENEDICT
6- 12
CASSIDY JUDITH
6-1511
CASWELL A E
6- 59
CATALANO EDWARD
6-1395
CAUGHLAN C N
6-1128 6-1129
CAVANAGH P E
6-1922
CAVE G C B
6- 98
CAWTHRON INST
6- A33
CECCHINI LOUIS P
6- 877
CENTRAL AEROSOL LABS
COLUMBIA UNIV
6- 609
CENTRAL AIR DOCUMENTS
OFFICE
6- 274
CHADWICK R
6-1252
CHAIKOFF I L
6- 798 6-1422
CHALMERS T A
6- 667
CHAMPION F C
6-1049
CHANDRASEKHAR S
6-1276 6-1277
CHANG L C
6- 600 6-1238
CHANG W Y
6- 265 6- 266
CHAPIRO ADOLPHE
6- 145
CHARD J E
6- A59
CHARLESBY A
6-1391
CHARPAK GEORGES
6-1355
CHASTEL RAYMOND
6-1331
CHATTERJEE S D
6-1764
CHAUDRON GEORGES
6- 549
CHEBINIAK P
6- 592
CHEMICAL AND
RADIOLOGICAL LAB
ARMY CHEMICAL CENTER
6-1611
CHEMICAL CORPS
6- 183
CHEN, N K
6-1736
CHENOUEARD J
6- 547
CHEW GEOFFREY F
6- 328 6-1031 6-1544
6-1896
CHICAGO UNIV
6- 353 6- 784 6-1083
6-1084 6-1375 6-1384
CHICK D R
6-1026
CHILDS W J
6- 739
CHMUTOV K V
6- 95
CHOPPIN GREGORY R
6-1125
CHORNEY WILLIAM
6- 163
CHRISTENSEN BERT E
6-1179
CHRISTENSON C W
6- A58

CHRISTIAN DARLEANE
6-1304
CHRISTIAN J W
6-1476
CHRISTIE JAMES H
6- 33
CHRISTS COLL
CAMBRIDGE UNIV ENGLAND
6-1198
CHU H T
6- 379
CHUKHANOV Z F
6- 188
CHUN M E
6-1579
CIBULA A
6-1253
CLABAUGH W J
6-1200
CLADIS JOHN BAROS
6- 361 6- 388 6-1753
6-1841
CLARK A C
6-1800
CLAY C S
6- 348 6-1418
CLAY J
6- 258 6- 262 6- 439
CLELAND J W
6-1349
CLEWS C J B
6-1478
CLIFFORD ALAN F
6- 552
CLINTON LABS
6- 76
CLUSIUS KLAUS
6- 287
COATES G E
6- 134
COBAS AMADOR
6- 610 6- 923
COBB JOSEPH R
6- 588
COBBLE JAMES W
6- 643 6-1420
COCCONI G
6-1872
COCKCROFT JOHN D
6- 514 6-1524
COFFINBERRY ARTHUR S
6-1729
COGAN DAVID G
6- 505
COHEN BERNARD L
6-1882
COHEN MARTIN J
6-1815
COHEN MORRIS
6- 594 6- 595 6- 598
6- 618 6-1467 6-1470
COHEN S G
6- 678
COHEN VICTOR W
6- 443 6-1165 6-1166
6-1928
COHN STANTON H
6- 28
COHN WALDO E
6-1172
COLBURN CHARLES B
6-1637
COLE L J
6- 23
COLE SANDFORD S
6- 911
COLER M A
6- 461
COLLEGE OF PHYSICIANS
AND SURGEONS
6-1388
COLLEGE OF SCIENCES AND
ARTS STATE COLL OF
WASH
6- 535
COLLI LAURA
6- 658
COLLINGS W DOYNE
6- 529
COLLINS CLAIR J
6- 175
COLLINS JOHN F
6- 900 6- 901
COLLINS T L
6- 991
COLNER WILLIAM H
6- 604
COLORADO AGRICULTURE
AND MEDICAL COLL
6- 979
COLTERYAHN L E
6- 234
COLUMBIA RADIATION LAB,
COLUMBIA UNIV
6-1782

COLUMBIA UNIV
6- 288 6- 360 6- 489
6- 490 6- 579 6- 600
6- 627 6- 700 6- 984
6-1221 6-1222 6-1223
6-1224 6-1304 6-1431
6-1469 6-1670 6-1738
COLUMBIA UNIV
SCHOOL OF MINES
6-1173 6-1238
COMBE JEAN
6-1881
COMINGS E W
6- 575
COMMISSARIAT A L ENERGIE
ATOMIQUE FRANCE
6- 547 6-1698 6-1699
CONARD G P
6- 618 6-1470
CONGER ALAN D
6- 4
CONNECTICUT AGRICULTURAL
EXPERIMENT STATION
6- 530
CONNOR R D
6-1805
COOK CHARLES J
6-1339 6-1528
COOK G B
6- 358
COOK MELVIN A
6- 890 6- 894 6-1426
6-1687
COOKE W DONALD
6- 574
COOKE-YARBOROUGH E H
6- 303
COOPER C D
6-1929
COOPER MARGARET
6- 212
COOPEY R W
6- 513
CORAK WILLIAM S
6-1739
CORDNER G D P
6-1691
CORK J M
6- 739 6-1907
CORMACK D V
6-1102
CORNATZER W E
6-1081
CORNELL AERONAUTICAL
LAB INC
6- 876 6- 936
CORNELL UNIV
6- 108
CORROSION LAB
MASS INST OF TECH
6- 588
CORSON DALE R
6- 661
CORWIN ROBERT W
6-1492
CORYELL C D
6- 731
COSMIC RAY LAB
UNIV OF PUERTO RICO
6- 923
COTE G L
6-1665 6-1666
COTTON E S
6-1268
COULING L
6- 601 6-1473
COULTER LOWELL V
6-1121
COURTNEY WELBY G
6- 813
COVEYOU R R
6- 953
COWAN FREDERICK P
6- 103
COWING RUSSELL F
6- 779
CRAFT A
6- 348
CRAGGS J D
6-1867
CRAIG J T
6- 163
CRAIG R S
6-1472 6-1479
CRAIG W F JR
6- 902
CRANDALL W B
6- 199
CRANDALL WALTER ELLIS
6- 362 6-1865
CRANE H R
6- 755
CRAWFORD J H JR
6-1349

AUTHOR INDEX

CREUTZ E C
6- 224 6-1883
CROATTO UGO
6-1167
CROCE ROMEO
6- 215
CROSS WILLIAM G
6- 450
CROSSLEY F A
6- 907
CROTTY HOMER D
6-1065
CROUCH MARSHALL F
6-1759
CROWE K
6- 362
CROWE R W
6-1129
CROWLEY J
6-1422
CRUSSARD JEAN
6-1427
CRYOGENIC LAB
OHIO STATE UNIV
6- 88
CUEILLERON JEAN
6- 607
CUER PIERRE
6- 397 6-1880 6-1881
CULLIHAN JOHN H
6-1437
CUNNINGHAM B B
6-1753
CUNNINGHAM C W
6-1158 6-1159
CURIE DANIEL
6-1262 6-1313 6-1363
CURRAH J E
6-1686
CURRAN S C
6- 307 6-1559
CURTIS H O
6-1268
CURTISS CHARLES F
6- 286
CURTISS L F
6- 268
CUSHMAN BONNIE E
6- 278
CYNARSKI J
6-1425
DAANE A H
6- 276 6- 471 6- 472
6-1464
DAHL HARRY M
6-1221
DAINTY J
6-1508
DAITCH P B
6-1547
DALE J K
6- 163
DALITZ R H
6-1425
DALY LYLE K
6- 81 6- 102
DAMIANO V V
6-1658
DANDL R A
6- 436
DANIELS J M
6- 997
DANILOV V N
6- 245
DANYSZ M
6- 308
DARBY E K
6-1913
DARBY J
6- 255
DARBY J F
6- 611
DARMOIS EUGENE
6- 541
DA SILVEIRA MARIETA
6- 40
DAUTREPPE DANIEL
6- 692
DAVIDSON J N
6- 112
DAVIDSON W L
6- 442
DAVIES A J
6- 195
DAVIES E L
6- 757
DAVIES J H
6- 259
DAVIES R W
6- 184
DAVIES W T
6- 723
DAVIS R C
6-1511

DAVIS ROBERT A
6-1702
DAVISON B
6- 332
DAVOLL JOHN
6-1178
DAWSON J K
6- 857
DAWSON M H
6- 603
DAY M J
6- 834 6- 835
DAYHOFF EDWARD S
6-1785
DAYKIN P N
6-1932
DEACON E L
6- 938
DE AMICIS EGILDA
6- 779
DEBENEDETTI S
6-1771 6-1839 6-1910
DEBIESSE JEAN
6-1292
DE BOER J
6-1422 6-1855
DEBRUYN P H
6-1083
DECIUS J C
6-1417
DEEM H W
6- 915
DEFORD DONALD D
6- 98
DE GRAAFF W
6-1275
DE GROOT S R
6-1909
DE HAAN H J
6-1203
DEHAAS B WALLACE
6-1120
DEHMELT H G
6- 343 6- 988
DELABARRE YVETTE
6- 104
DELAHAY PAUL
6-1635
DE LA NOCEDA J GARCIA
6- 923
DE LATTRE A
6-1667
DELBART GEORGES
6-1240
DELBECO CHARLES
6-1427
DEL CASTILLO G
6- 265 6- 266
DELWICHE EUGENE A
6-1070 6-1597
DEMEUR M
6-1362
DEMONT J
6- 469
DEMOS P T
6-1541
DEMOSS RALPH D
6-1619
DEMPSTER A J
6- 473
DENBIGH K G
6-1775 6-1776
DENT JAMES NORMAN
6- 111 6-1080
DEPARTMENT OF MINES AND
TECHNICAL SURVEYS
CANADA
6- 109 6-1220 6-1451
DEPIERRE VINCENT
6- 250
DERGE GERHARD
6- 599
DE SHALIT A
6-1925
DESIGNERS FOR INDUSTRY
INC
6-1724
DESMON LELAND G
6- 857
DESPREZ R
6-1289
DESTOUCHES-FEVRIER
PAULETTE
6-1367
DETRICK LAWRENCE E
6-1617
DEUTSCH MARTIN
6- 681 6-1843 6-1861
DEUTSCH ROBERT W
6- 390
DEVAY J E
6- 499 6- 759
DE VISSCHER MICHEL
6-1104

DEWAN J T
6-1886
DEWELL EDGAR HARRISON
6- 86
DEYSINE A
6-1603
DHARMATTI S S
6- 345 6- 994
DICKSON J M
6- 376
DIEKE G H
6-1573
DIENES G J
6-1152
DILTS R V
6-1400
DIMOND A E
6- 530
DIOGENOV G G
6- 94
DION H G
6- 968
DIPIETRO W O
6- 223
DIPPEL W A
6-1655
DIRAC P A M
6- 621
DIRITO V L
6-1549
DISTEFANO V
6- 21
DITTMAN A L
6-1566
DIVISION OF RAW
MATERIALS AEC
6- 212
DIVISION OF RESEARCH
AEC
6-1487
DIXON D
6-1559
DIXON JOSEPH A
6- 122
DIXON W R
6-1102
DOBBINS WILLIAM E
6-1597
DOBROTTIN N A
6- 260 6- 261
DODGEN H W
6- 535
DODSON R W
6-1182
DOERNER ROBERT
6- 954
DOHERTY DAVID G
6- 150 6- 162 6-1094
DOHNE C F
6-1498
DOLAN THOMAS J
6- 193 6-1722
DOLE MALCOLM
6-1124
DOLL DENTON T
6-1465
DOMBROVSKAYA N S
6- 96
DOMINE-BERGES MARTHE
6- 856
DONAHUE T M
6- 927
DORN JOHN E
6- 231 6-1235
DOSSEY JAMES L
6-1783
DOUGHERTY JAMES
6- 15
DOUGLAS BODIE E
6-1633 6-1634
DOUGLAS JOHN E
6- 828
DOW CHEMICAL CO
6- 228 6- 814 6- 903
DOWBEN R M
6- 282
DOWDY A H
6- 35
DRAIN L E
6- 154
DRICKAMER H J
6- 937 6- 575 6- 800
6- 801 6- 804 6- 826
6- 895 6- 934
DRUYVESTEYN M J
6- 241
DUBININ G N
6- 912
DUGRET L P
6- 542
DUDLEY HORACE G
6- 494 6- 527
DUDLEY ROBERT AUGUR
6- 964

NUCLEAR SCIENCE ABSTRACTS

DUDZIAK WALTER F
6- 974
DUFFY J G
6- 870
DUFOUR CH
6-1350
DUHAMEL GERARD
6-1614
DUHAMEL J
6-1099
DUKE FREDERICK R
6- 573 6- 813
DUKE UNIV
6-1590 6-1595 6-1759
6-1929
DULIT EVERETT
6- 681
DUMOND JESSE W II
6- 444 6- 446 6-1861
DUNBAR D N F
6- 710
DUNCOMBE E
6- 864
DUNKERLEY F J
6-1658
DUNLAVEY DEAN C
6- 416
DUNN C G
6- 230
DUNN RAYBURN W
6-1790
DUNNING WAYNE W
6-1504
DUNSMORE HELEN S
6- 441
DURBIN R
6- 329
DUVAL XAVIER
6-1669
DUWEZ POL
6- 209 6- 233 6- 249
6-1196 6-1230 6-1231
6-1232 6-1243 6-1249
DZHELEPOV B S
6- 395 6- 421 6- 433
DZIUBA S
6-1089
EASTWOOD L W
6-1732
EBEL R A
6-1663
EBERLE ALLAN R
6-1401
EBNOTHER A
6- 570
EBY F S
6- 966
ECKERT ROGER E
6- 895
EDELEANU C
6-1219
EDELMAHN ABRAHAM
6- 507
EDELSON D
6-1411
EDEN R J
6-1942
EDICK MELVIN
6- 796
EDLUND M C
6- 694
EDSE RUDOLPH
6- 274
EDWARDS D A
6- 235
EDWARDS GAIL P
6-1597
EDWARDS JAMES W
6- 88
EGAN W G
6-1800
EGGENBERGER C
6- 367
EHRENREICH RICHARD
6-1597
EHRlich MARGARETE
6- 295
EICHHOLZ G G
6-1451
EIDINOFF M L
6- 61
EIMER LOIS
6- 85 6- 572 6-1182
EISENSTEIN JULIAN
6- 608
EISTER W K
6-1213
EL-BEDEWI F A
6- 375 6- 708 6-1892
ELIASSEN ROLF
6- 515
ELION GERTRUDE B
6-1112

ELLENBURG JANUS Y
6-1145
ELLINGER F
6-1097
ELLIOTT SYLVIA B
6-1500
ELMORE W C
6-1577
ELVING PHILIP J
6- 538 6- 806 6- 807
6- 808 6-1538 6-1639
6-1640
EMMONS A H
6-1610
ENGELKEMEIR D W
6- 475 6-1906
ENGINEERING RESEARCH
INST UNIV OF MICHIGAN
6- 916 6-1756
ENGLAND ROBERT D
6-1799
ENGSTROM ARNE
6-1101
ENRIGHT D P
6- 116 6- 117 6- 118
6- 119
ENTENMAN CECIL
6-1422 6-1593 6-1594
EPP E R
6-1102
EPSTEIN LEO F
6-1491
ERIKSON R A
6-1548
ERNST ROBERT
6-1193
ERTAUD A
6- 696 6- 597
ESTRIN M
6-1496
EVANS ERSER A
6-1626 6-1550
EVANS G E
6-1189 6-1549
EVDOKIMOVA T P
6- 795
EVERHART EDGAR
6-1768
EWING CURTIS T
6- 232 6-1444
EYGES L
6- 364 6-1326
EYRING HENRY
6- 498
EZMIRLIAN FLORITA
6- 69 6- 70
FACCHINI UGO
6- 658
FAIRBROTHER FRED
6- 410
FAIRCHILD L W
6- 4
FAIRSTEIN E
6- 435
FALK VAIRANT PAUL
6- 418
FARR RICHARD S
6-1083
FASSELL W MARTIN
6- 896
FAUNY G
6-1296
FAUNY M
6-1296
FAUQUEZ H
6- 696
FAUST W R
6-1898
FEATHER N
6-1558
FEDORUK S O
6-1102
FEILD R B
6-1439
FEITELBERG SERGEI
6- 519
FELD B T
6-1839
FELDMEIER J R
6- 920
FELDSTEIN O
6- 663
FERGUSON G J
6-1814
FERLAND T
6-1398
FERMI E
6- 353 6-1818
FERNELIUS W CONARD
6- 808 6-1533 6-1634
FERRARO JOHN R
6- 78

FERRELL RICHARD A
6- 447
FESENKO E G
6- 207
FESHBACH HERMAN
6-1904
FIELD MARY JANE
6- 238
FINDLAY G R
6- 223
FINEMAN PHILLIP
6- 518
FINLAY W L
6- 908
FISCHER R B
6-1740
FISCHER VERA
KISTIAKOWSKY
6-1927
FISCHER WERNER
6- 824
FISHER C
6-1698
FISHER CH
6-1325
FISHER H
6-1422
FISHER INGA
6-1303
FISHER W
6-1564
FISHER THOMAS F
6- 252
FISHLER M C
6- 23 6-1422
FISHMAN HERBERT
6-1534
FITZGERALD PATRICK J
6- 61
FLANAGAN R
6-1473
FLANAGAN W E
6- 598 6-1467
FLANNAGAN R
6- 601
FLEISCHMANN R
6- 712
FLEMING R O JR
6- 403
FLINN P A
6- 598 6-1467
FLOOD H
6-1398
FOEX MARC
6-1684
FOLDY L L
6- 382
FOLGER R L
6-1862
FOPIANO P
6- 618 6-1470
FORD A G
6-1033
FORD E
6- 930
FORSYTH P J E
6-1248
FORTY A J
6-1410
FOSS RODNEY H
6-1390
FOSTER J W
6- 532
FOWLER E C
6- 315 6- 316 6-1817
FOWLER J L
6-1856
FOWLER P H
6- 259
FOWLER R D
6-1570
FOWLER W B
6- 315 6- 316 6-1817
FOWLER WILLIAM ALFRED
6-1875
FOX M
6- 288
FOX R E
6-1263
FRANCIS HOWARD T
6- 604
FRANCIS J E
6-1511
FRANCIS N C
6- 973
FRANCK J
6- 732
FRANK WILSON J
6- 323
FRANKLIN E
6- 313 6- 590
FRANZ W
6-1369

AUTHOR INDEX

FRANZINOTTI C
6- 259
FRASER G H
6-1814
FRAUENFELDER H
6- 347 6- 417
FREEDMAN M S
6-1048 6-1906
FREEMAN G P
6-1294
FREEMAN JAMES W
6-1207
FREIER GEORGE
6-1900
FREISER HENRY
6-1632 6-1654
FRENCH J B
6-1547
FRENKIEL F N
6- 331
FREUND HARRY
6-1143
FREY D N
6-1207
FRIEDBERG FELIX
6-1696
FRIEDBURG HELMUT
6-1335
FRIEDEL HYMER L
6- 33 6-1378 6-1379
FRIEDLAND STEPHEN S
6- 312
FRIEDMAN HELEN L
6- 976
FRIEDMAN LEWIS
6- 551
FRISCH O R
6-1754 6-1859
FRITH WILLIAM C
6- 410
FROEHLICH FRITZ E
6- 924
FROST R H
6- 945
FRUSH H L
6-1430
FRY ARTHUR
6- 417 6- 831 6- 832
6- 854
FRY W F
6- 327
FRYER G
6-1916
FUCHS L
6-1260
FUJIWARA SHIZUO
6-1142
FUKS N A
6- 189
FUNDINGS LAND O T
6-1490
FURBERG S E
6-1353
FURMAN N HOWELL
6- 90 6- 574 6-1400
6-1655
FURTH J
6- 20 6- 25 6- 776
6-1071 6-1076 6-1080
6-1117 6-1598 6-1599
FUYAT RUTH K
6-1452
GADSDEN E
6-1080
GAGLIARDI E
6-1402
GAITHER NENITA
6- 48
GALANIN A D
6- 455
GALBRAITH W
6-1851
GALLONE S
6-1934
GALLOP J W
6-1024
GAMBLE LEON W
6-1144
GAMOW G
6-1754
GANZ AARON
6- 74
GARBER H J
6-1440 6-1441
GARFUNKEL M P
6- 920
GARRETT C
6-1102
GARRIGUE HUBERT
6- 429 6-1358
GARRISON WARREN M
6- 152 6- 153
GASSTROM R V
6-1105

GATES AND CRELLIN LABS
OF CHEMISTRY CALIF
INST OF TECH
6- 136
GATTI EMILIO
6- 658
GAUNT J
6- 155
GAUZIT MAURICE
6-1642
GAY WALTER E
6-1206
GEACH G A
6-1256
GECKLER R P
6- 140 6-1108
GEIGER KLAUS
6-1926
GEILING E M K
6- 74
GEMMILL CHALMERS L
6- 80 6- 803
GENDRON PIERRE R
6- 664
GENERAL ELECTRIC CO
6- 230 6-1317 6-1723
GENERAL ELECTRIC
RESEARCH LAB
6-1239 6-1475
GEOLOGICAL SURVEY
6- 213 6- 214 6- 589
6- 764 6-1136 6-1452
6-1453 6-1454 6-1455
6-1456 6-1457 6-1458
6-1459
GERHART J
6-1911
GERSCH MANFRED
6-1381
GEST HOWARD
6- 546
GHERI HERMA
6-1767
GHIORSO ALBERT
6- 357 6- 410 6- 412
6- 736
GHOSH S K
6-1824
GIACOMELLO GIORDANO
6-1167
GIBBS JULIAN H
6- 131
GIBBS MARTIN
6- 165 6- 546 6-1619
GIBSON M
6- 544 6- 545
GIBSON W M
6-1330 6-1869 6-1870
GILARDONI ARTURO
6-1613
GILBERT F C
6- 390 6-1030
GILBERT W S
6- 701 6- 702
GILBERT WILLIAM
6-1863
GILE JEANNE D
6- 152 6- 153
GILES NORMAN H JR
6- 24 6- 26
GILES PETER C
6- 656
GILL P S
6- 268
GILLAIN F
6-1560
GILLIESON A H C P
6- 849
GILLON L
6-1542
GIMENEZ C
6- 587
GINSBURG J
6-1110
GINZBURG L I
6- 581
GJOSTEEN O G
6- 219
GLAUBER ROY J
6- 745
GLENDEIN L E
6-1327
GLENN WILLIAM E
6- 289
GLENNAN T KEITH
6-1187
GLOTZER D J
6-1606
GODDARD D R
6- 194
GOFF JOHN L
6- 505
GOFMAN JOHN W
6- 19 6- 38

GOKHALE BHASKAR
GANGADHAR
6- 97
GOLANT V E
6- 981
GOLDBERG H D
6- 487
GOLDBERG M I
6- 487
GOLDBERG NEWTON N
6- 91
GOLDBERGER MARVIN L
6- 328 6-1039
GOLDBLITH S A
6- 511
GOLDEN L B
6-1236
GOLDFEDER ANNA
6-1091
GOLDHABER M
6- 734 6-1839 6-1909
GOLDHOFF R M
6-1732
GOLDMAN MORTON I
6- 515
GOLDSTEIN J H
6-1673
GOLDSTEIN LOUIS
6- 726 6-1546 6-1830
GOMBERG H J
6- 916
GOODMAN RAYMOND D
6- 13 6- 37 6- 765
GOODRICH B F CO
6- 442
GOODWIN H B
6- 227
GOODWIN W E
6-1087
GORA E
6-1935
GORBUNOV N I
6- 782
GORDON E LEITER
6-1606
GORDON LOUIS
6-1174
GORDON PAUL
6-1433 6-1745
GORDON S A
6- 164
GORDON SHEFFIELD
6- 556 6-1676
GORELIK S I
6-1214 6-1215
GORMAN ARTHUR E
6-1195
GORTER C J
6- 239
GOTTSTEIN K
6- 391
GOUDSMIT S A
6-1283
GOULD R GORDON
6- 565
GOURLEY D R H
6- 790 6- 802
GOVE H E
6-1918
GOWARD F K
6- 699 6- 709
GRACE M A
6- 997 6-1915
GRAEVSKAYA YA I
6- 261
GRAF H
6-1098
GRAFF A P
6-1589
GRAHAM DEAN M
6- 19
GRAHAM R L
6- 426
GRAND J A
6-1444
GRANGER HARRY C
6- 214 6-1457
GRASSI R C
6-1723
GRAUL E H
6-1679
GRAVES ELIZABETH
6- 505
GRAVESON ROBERT T
6- 628
GRAY J LORNE
6-1416
GRAY P M J
6-1688
GRAY ROBERT V
6-1445
GRAY SEYMOUR J
6- 7 6- 9
GREEN F P
6-1535

NUCLEAR SCIENCE ABSTRACTS

GREEN J H
6-1679
GREEN JACK
6-1222
GREEN L
6-1721
GREEN L JR
6-1197
GREEN LEON JR
6-1232
GREENAWAY H T
6-1259
GREENBERG D H
6-700
GREENBERG DAVID M
6-171
GREENEWALD H
6-1229
GREENFIELD M A
6-13
GREENHOUSE HAROLD M
6-208
GREENING J R
6-392 6-730
GRELE MILTON D
6-866
GRIEL JOHN V
6-1149
GRIGOROV N L
6-261
GRILLY E R
6-1774
GRIMALDI F S
6-1136
GRISARD J W
6-1159
GRIVET PIERRE
6-454
GROBECKER DOUGLAS W
6-1465
GRODZINS LEON
6-265
GROETZINGER BERHART
6-1A99
GROSSE ARISTID V
6-129 6-132
GROSSKINSKY OTTO ALFRED
6-569
GROSSWEINER L
6-1287
GROVE D J
6-1263
GROVE D M
6-190
GRUMMITT W E
6-1A57
GRUNE WERNER N
6-1597
GRUNER JOHN W
6-891
GRUNLAND JEAN M
6-139
GRUTTNER BARBARA
6-821
GUDTISOV N T
6-912
GUEBEN GEORGES
6-1540
GUERON J
6-547
GUNN J C
6-1A68
GUNSALUS I C
6-165
GURIAN JOAN M
6-784
GURIN SAMUEL
6-174
GURINSKY DAVID H
6-224 6-1315
GURNEY R
6-1414
GUSEVA L N
6-242
GUSTAFSON GORDON E
6-50
GUTH EUGENE
6-1902
GUTOWSKY H S
6-351
GUTTAG NORMA S
6-1136
HAAS CHARLES G
6-1631 6-1533
HABER-SCHAIM URI
6-1762
HADDEN R J B
6-271
HADER RODNEY N
6-914
HADLEY JAMES WARREN
6-361 6-716
HADORN ERNST
6-767

HAEFNER RICHARD R
6-691
HAFSTAD LAWRENCE R
6-1318
HAHN B
6-402
HAHN RICHARD B
6-1648 6-1649
HAHN T M
6-1935
HAINES H R
6-1228
HAISSINSKY MOISE
6-144 6-146 6-837
HAKEN H
6-754
HALBACH K
6-314
HALBERSTADT J
6-305
HALES R W
6-670
HALEY THOMAS J
6-1600 6-1617
HALG W
6-838 6-1924
HALL B VINCENT
6-1608
HALL H TRACY
6-1412
HALL HARVEY
6-1034
HALL JAMES L
6-1125
HALL ROBERT H
6-528
HALL W H
6-605 6-506
HALLER GEORGE L
6-808
HALPERN J
6-706
HALPERN OTTO
6-1014 6-1034
HAMERMESH MORTON
6-679
HAMILTON DONALD R
6-356
HAMILTON JOSEPH G
6-152 6-153 6-496
6-1389 6-1422
HAMMER P C
6-948 6-949 6-950
6-1796
HAMMOND CAROLYN W
6-784 6-1384
HANCE PAUL D III
6-406
HANDFORTH S L
6-1571
HANFORD WORKS
6-105 6-196 6-513
6-1211 6-1442
HANSEN R D
6-1733
HANSON A O
6-480 6-1035 6-1036
6-1037 6-1576
HARDWICK J
6-313 6-1802
HARING M M
6-960 6-1278
HARMAN C G
6-884
HARRER J M
6-1527
HARRINGTON H
6-659
HARRIS G B
6-1477
HARRIS J
6-134
HARRIS JOHN N
6-191 6-937
HARRIS WILLIAM M
6-338
HART EDWIN J
6-1677 6-556
HARTMANN HELLMUTH
6-811
HARTMANN HERMANN
6-1644 6-1645 6-1647
HARTMANN IRVING
6-1627
HARTNETT J P
6-1200
HARVARD UNIV
6-336
HARVARD UNIV
MEDICAL SCHOOL
6-758 6-791 6-793
HARVEY G G
6-1750
HARVEY ROBERT L
6-1611

HARWELL GEORGE T JR
6-1081
HARWOOD JULIUS J
6-210
HASLAM R N H
6-1012 6-1332 6-1354
6-1861
HASTINGS A BAIRD
6-758 6-791
HASZELDINE R N
6-553 6-1157
HATTON J
6-255
HAUFFE KARL
6-1683
HAUGSNES J
6-644
HAUPTSCHNEIN MURRAY
6-129 6-132
HAVENS W W JR
6-984 6-1304
HAWKINS NORVAL J
6-1165
HAWORTH L J
6-1883
HAYAKAWA S
6-1812
HAYES EARL T
6-1229
HAYES F NEWTON
6-294 6-1390
HAYES JOHN R
6-1406
HAYES S
6-601 6-1473
HAYES THOMAS L
6-38
HAYNES C W
6-601 6-1473
HAYS E E
6-481 6-1283
HAZEN W E
6-1756
HAZLETT T H
6-1733
HECKMAN HARRY H
6-319 6-322
HECKROTTE W
6-975
HECQ M Y
6-1542
HEDBERG KENNETH
6-136
HEER E
6-347
HEIKKILA W
6-930
HEISLER CHARLES
6-1378
HEITMAN HUBERT JR
6-796
HELLER R E
6-941
HELLER ROBERT B
6-954
HELLER Z H
6-1032
HELLWEGE A M
6-1272
HELLWEGE K H
6-1272
HENDERSON JOSEPH E
6-929
HENDERSON W J
6-1557
HENGLEIN ARNIM
6-1284
HENLEY E
6-1512
HENLEY ERNEST J
6-660
HENNING GERHART
6-1415
HENRI VICTOR P
6-1421
HENRICH L R
6-975
HENRY E C
6-200
HENRY KATHERINE E
6-494
HENSEN J
6-31
HENSLEY EUGENE B
6-1486
HEPNER W A
6-1059
HERBST H J
6-109
HERCZEG C
6-1698
HERIC E L
6-868
HERMAN ROBERT C
6-1755

AUTHOR INDEX

HERMON S E
6-1407

HERPIN A
6-1350

HERRE MYRON G
6-914

HERSKOWITZ IRWIN H
6-769

HERVE A
6-51 6-1385

HESS DANIEL N
6-175

HESS DAVID C
6-972 6-1327

HESS W
6-361 6-388

HESS WENDELL F
6-888

HEUMANN F K
6-1130

HEUSINKVELD M
6-1900

HEUSTIS ALBERT E
6-1096

HEWITT JOHN E
6-38

HEWSON E WENDELL
6-676 6-1516 6-1517
6-1518 6-1519 6-1520

HEYWOOD W A
6-1707

HIBBERT CELESTA J
6-1491 6-1707

HICKAM W M
6-1263

HIGHMAN BENJAMIN
6-1090

HIGINBOTHAM W A
6-479

HILBORN JOHN W
6-1220

HILDEBRAND R H
6-655 6-670

HILL A G
6-1750

HILL D G
6-180

HILL D L
6-698

HILL E L
6-637

HILL GEORGE RICHARD
6-897

HILLGER R E
6-1521

HILLIARD J
6-598 6-1467

HILSE R M
6-1114

HILST G R
6-1442

HILTON CLIFFORD L
6-806

HINTENBERGER HEINRICH
6-290

HIRSCH CHARLES E
6-1211

HIRSCHFELDER JOSEPH O
6-286

HIRST F
6-710 6-711

HITCHINGS GEORGE H
6-1112

HODGE E B
6-163

HODGSON P E
6-1766

HODGSON WILLIAM
6-1128 6-1129

HOEKSTRA H R
6-467

HOERGER EARL
6-850

HOERLIN HERMANN
6-311

HOFSTADTER R
6-1806

HOHMANN EMIL
6-824

HOLDSWORTH J F
6-875

HOLLADAY J W
6-1732

HOLLAENDER ALEXANDER
6-47 6-49 6-1079

HOLLCROFT JOANNE WEIKEL
6-1082 6-1607

HOLLEY CHARLES E JR
6-1131

HOLLOMON J H
6-1239

HOLLOWAY G E
6-946

HOLMES D K
6-695 6-1000

HOLMES JOHN R
6-445

HOLMES S G
6-797

HOLT N B
6-1430

HONEYCOMBE R W K
6-1250 6-1254 6-1255

HOOD RICHARD
6-860

HOOPER J E
6-1765

HOOPER W H L
6-1252

HOOVER J I
6-946 6-1898

HOOVER MORGAN M
6-240

HOPPER V D
6-611

HOREMAN H W
6-300

HORIZONS INC
6-236 6-1737

HORN F HUBBARD
6-1264

HORNBECK JOHN A
6-931 6-947

HORNBERGER WILHELM
6-42

HORNYAK W F
6-641

HOROWITZ J
6-1300

HORRIGAN ROBERT V
6-1552 6-1706

HORSLEY R J
6-1332

HORTON W S
6-951

HOUGH E W
6-1164

HOUTERMANS F G
6-1809

HOWARTH L
6-1716

HOWATSON A F
6-401

HOWELL LAWRENCE J
6-1173

HOWELL W D
6-1495

HOWELLS G A
6-1505

HOWTON DAVID R
6-1702

HSU EN-YUN
6-184

HU F N
6-797

HU HSUN
6-1242 6-1245

HUBBARD D O
6-470

HUBBARD E L
6-1901

HUBBARD HARMON
6-1481

HUBER ELMER J JR
6-1131

HUBER O
6-1925

HUBER P
6-402 6-1018 6-1859
6-1895

HUBERT PIERRE
6-281 6-741

HUBY R
6-1888

HUDES I
6-1758

HUDSON DONALD E
6-942 6-968

HUDSWELL F
6-639

HUGHES A W
6-478

HUGHES D J
6-381 6-1860 6-1903

HUGHES I W
6-819

HUMBEL F
6-1925

HUME DAVID N
6-98

HUMMERS W S
6-1396

HUMPHREY WATTS JM
6-1899

HUNT ERNEST L
6-111

HUNTEN D M
6-1849

HURST G S
6-1288

HURST R
6-833

HURST WILLIAM M
6-1116

HUSTON J L
6-1626 6-1550

HYDE EARL K
6-818

HYDRODYNAMICS LABS
CALIFORNIA INST OF
TECH
6-184

IKENBERRY LUTHER C
6-1139

ILLINOIS INST OF TECH
6-552

ILLINOIS UNIV
6-537 6-543 6-575
6-800 6-801 6-804
6-826 6-895 6-934
6-1608 6-1708

ILLINOIS UNIV
ENGINEERING EXPERIMENT
STATION
6-1439 6-1722

INALL E K
6-1338

INDENBOM V L
6-330

INGHRAM MARK G
6-288 6-972 6-1327
6-1793

INGLIS D R
6-405 6-1839

INSTITUTE FOR ATOMIC
RESEARCH IOWA STATE
COLL
6-813

INSTITUTE FOR CANCER
RESEARCH PHILADELPHIA
6-760 6-761 6-792
6-794

INSTITUTE FOR NUCLEAR
STUDIES UNIV OF
CHICAGO
6-1754 6-1793 6-1818
6-1819 6-1833 6-1839
6-1A59 6-1860 6-1861
6-1883 6-1887 6-1909
6-1931

INSTITUTE FOR THE STUDY
OF RATE PROCESSES
UNIV OF UTAH
6-890 6-894 6-896
6-897 6-1426 6-1637
6-1687

INSTITUTE OF
ENGINEERING RESEARCH
UNIV OF CALIFORNIA
6-201 6-202 6-231
6-1200 6-1235 6-1733

INSTITUTE OF
RADIOBIOLOGY AND
BIOPHYSICS
UNIV OF CHICAGO
6-10 6-784

INTRATER J
6-600 6-1238

IOWA STATE COLL
6-159 6-812 6-1072

IRVINE JOHN W JR
6-1853

IRVING J
6-1868

ISBELL H S
6-1430 6-1700

ISHIBASHI S
6-892

JACCARINO VINCENT
6-1310

JACKSON HARRIS
6-60

JACOBSEN J C
6-1909

JACOBSON KURT P
6-40

JACOBSON L
6-1422

JACOBSON MURRAY
6-1627

JACQUET PIERRE A
6-248

JAEGER G
6-1726

JAFFE ELIZABETH B
6-764

JAFFEE R I
6-908 6-1732

JAGEL R C
6-1431

JAHN H A
6-1364

NUCLEAR SCIENCE ABSTRACTS

JAKOBSON MARK J
6- 324 6- 671
JAMES ARTHUR G
6-1103
JAMES HUBERT M
6- 557
JAMES J C
6- 564 6- 841
JAMES RALPH A
6- 736
JANNOT M
6-1289
JANOSSY LEONIE
6- 616 6- 753
JANSSEN E F
6-1375
JARBOE CHARLES HARRY
6- 851
JARY ROBERT
6- 856
JASTROW R
6- 686 6-1834
JAUCH J M
6-1846
JEFFERSON W E
6- 532
JEFFRIES C D
6-1A50
JENKINS A E
6-1247
JENKINS F A
6- 460
JENKINS WILLIAM A
6- 284
JENNY L
6- 838
JENSEN J HANS D
6-1A38 6-1839
JENSSEN GUDBRAND
6- 309
JENTSCHKE W K
6- 966
JET PROPULSION LAB
CALIF INST OF TECH
6-1066 6-1164 6-1196
6-1230 6-1231 6-1232
6-1233 6-1234
JOHANSON CARL-ERIK
6-1105
JOHANSSON SVEN A E
6-1803
JOHNS H E
6-1102 6-1332
JOHNS HOPKINS UNIV
6- 6 6- 789 6- 883
6- 961 6-1165 6-1509
6-1662
JOHNSON K
6-1337
JOHNSON ALDIE E JR
6- 899
JOHNSON H A
6-1200
JOHNSON H R
6- 548
JOHNSON M H
6- 622
JOHNSON N K
6- 756
JOHNSON T H
6-1818
JOHNSON THOMAS H
6-1487
JOHNSON VIRGIL R
6- 985 6- 987
JOHNSON WALTER H JR
6- 991
JOHNSTON HERRICK L
6- 88
JOHNSTON REED H
6- 555
JOHNSTON WILLIAM DWIGHT
6-1632
JOHNSTONE S T M
6-1259
JOLLY WILLIAM L
6- 809 6-1641
JONES E A
6-1668
JONES EMERSON
6-1339 6-1528
JONES G M D B
6-1A24
JONES H M
6-1893
JONES HARDIN B
6- 19 6- 38
JONES LAWRENCE W
6-1538
JONES MERLE EUGENE
6- 123
JONES STANLEY L
6-1138
JONES W H
6-1A56

JORDAN CHARLES B
6- 249
JORDAN W H
6-1511
JORGENSEN THEODORE
6-1339 6-1528
JOYET GUSTAVE
6- 512
JUDD D L
6- 918
JUNG JEAN J
6-1880
JURNEY E T
6- 980 6-1526
JUZA ROBERT
6-1643 6-1661
KAHAN THEO
6-1292
KAHN HERMAN
6- 952
KAHN J B JR
6-1598
KAHN JACK H
6- 409 6-1499
KAHN M
6-1568
KALLMANN HARTMUT
6-1392 6-1749
KAMEFUCHI S
6- 674 6- 750
KAMEN M D
6- 463
KAMMERER O F
6-1463
KANNER H
6-1905
KAPL STAFF
6- 882
KAPLAN HENRY S
6-1382
KAPLAN LOUIS
6-1176
KAPLON M F
6- 925 6-1469 6-1513
6-1514
KARABINOS J V
6-1430 6-1700
KARDYS C
6-1431
KARP IRA L
6- 687
KARPLUS ROBERT
6- 690
KARUSH W
6-1710
KASHCHENKO L A
6- 772
KASTLER ALFRED
6-1311
KASTNER J
6-1912
KATO TOSIO
6- 719
KATSCHER FRIEDRICH
6-1346
KATSH SEYMOUR
6- 507
KATZ JOSEPH J
6- 125 6- 467
KATZ L
6- 365 6-1871 6-1876
KATZ WALTER
6-1128 6-1129
KATZENSTEIN HENRY S
6- 312
KATZIN LEONARD I
6- 78 6-1428 6-1694
KAUFMAN WARREN J
6- 515
KAUFMANN A R
6-1745
KAWAGUCHI S
6- 167
KEARNS W H
6- 227
KEDZIE CHEMICAL LAB
MICHIGAN STATE COLL
6-1618
KEELER J H
6-1475
KEHL GEORGE L
6-1469 6-1738
KEHOE EDWARD J
6-1394
KEIM C P
6- 285 6-1791
KELLER K K
6-1408
KELLER W D
6-1728
KELLEX CORP
6-1705
KELLEY MYRON T
6-1163 6-1649

KELLOGG H H
6-1173
KELLY W C
6-1919
KELSEY F E
6- 74
KENASTON CAROLYN B
6-1590
KERN S A
6- 486 6- 488
KERR PAUL F
6-1221 6-1222 6-1223
6-1224
KERST D W
6-1861
KERTH LEROY
6- 297
KETCHEN EUGENE E
6-1127 6-1132
KETELLE B H
6- 435 6- 436
KHILKO N I
6- 263
KHODAKOV A L
6- 207
KHODAKOV G N
6- 260
KHOLNOV YU V
6- 421
KHOLDOVSKI I G E
6- 871
KHUDYAKOV G N
6- 188
KHYM JOSEPH X
6- 148 6- 843
KICHENASSAVY S
6-1361
KIEFFER R
6-1126
KIKUCHI C
6-1166
KIKUCHI SEISHI
6- 703 6-1861 6-1865
KILE J C JR
6- 45
KILLEEN JOHN
6- 378
KIMBALL R F
6- 46 6- 48 6- 140
6-1108
KING CECIL V
6- 889 6-1468
KING D T
6-1765
KING EDWARD L
6- 79
KING H T
6-1316
KING JOHN GORDON
6-1310
KING L D P
6- 999 6-1852
KING ROBERT U
6- 213 6- 214
KINGERY W D
6- 204 6- 205 6-1448
6-1449
KINGSBURY S A
6- 662
KIP A F
6-1541
KIP ARTHUR F
6-1312
KIRBY H W
6-1432
KIRBY-SMITH J S
6- 27
KIRZHNITS D A
6-1365
KISIELESKI W E
6- 625
KISSINGER CHARLES W
6- 612
KISTLER KATHERINE
6- 12
KIT SAUL
6- 171
KITTEL J HOWARD
6-1741
KIVALO PEKKA
6- 543
KJELDAAS T JR
6-1263
KLECHKOVSKI I V M
6- 795
KLEIBER MAX
6- 796
KLEIN ABRAHAM
6- 690
KLEIN G
6- 258
KLEMA E D
6-1535
KLESER ERNST
6- 829

AUTHOR INDEX

KLINK C C
 6-1510
 KLING H P
 6-503
 KLINKENBERG P F A
 6-342
 KNABLE N
 6-655 6-670
 KNIPP J K
 6-1440
 KNOLL J E
 6-61
 KNOLLS ATOMIC POWER LAB
 6-106 6-107 6-252
 6-592 6-882 6-951
 6-1183 6-1342 6-1436
 6-1445 6-1491 6-1630
 6-1707 6-1730 6-1780
 6-1908
 KNOTEK O
 6-1126
 KNOWLES D J
 6-1288
 KOCH RUPRECHT
 6-56 6-1383
 KOCH WILHELM
 6-63
 KOEHLER W C
 6-1038 6-1548 6-1729
 KOENIG VIRGIL L
 6-30 6-762
 KOESTER LOUIS J JR
 6-986
 KOFOED-HANSEN O
 6-1437 6-1920
 KOHLER UDO
 6-18
 KOHN WALTER
 6-727
 KOLETSKY SIMON
 6-50
 KOLONTSOVA E V
 6-244 6-247
 KORNGOLD LEONHARD
 6-1113
 KOSKI W S
 6-961 6-1165 6-1509
 KOUDIJS B
 6-396
 KRAFT L G
 6-1751
 KRAMER ANDREW W
 6-1001
 KRAMER I R
 6-1742
 KRAUS KURT A
 6-1689
 KRICHEVSKII I R
 6-187
 KRIESSMAN C J JR
 6-1943
 KRINSKY H Y
 6-1670
 KRISHNAMURTY K V S
 6-1147
 KRISTJANSON A M
 6-968
 KRITCHEVSKY DAVID
 6-852
 KROHMER JACK S
 6-304
 KROLL NORMAN M
 6-451
 KRONBERGER H
 6-1185
 KRONSTADT R
 6-1401
 KRUCOFF DARWIN
 6-1527
 KRUGER H
 6-344
 KRUGER P G
 6-966
 KRUMBEIN A D
 6-970
 KRUMHOLZ LOUIS A
 6-11
 KRUSE U E
 6-1025
 KUDRYAVTSEV E V
 6-873
 KUHN H
 6-743
 KUIPER G
 6-1754
 KUNDU D N
 6-705
 KURA J G
 6-1732
 KURENEV V YA
 6-1359
 KUTATELADZE S S
 6-872
 KWAL BERNARD
 6-722 6-1061
 KYLES J
 6-1557
 LABELLE C W
 6-1089
 LABEYRIE JACQUES
 6-587 6-566
 LABORATORY FOR NUCLEAR
 SCIENCE AND
 ENGINEERING
 MASS INST OF TECH
 6-296 8-359 6-407
 6-654 6-816 6-1393
 6-1424 6-1483 6-1533
 6-1A53
 LAFOUCRIERE J
 6-633
 LAGARRIGUE A
 6-1298
 LAITINEN H A
 6-543
 LALLEMANT CLAUDE
 6-666
 LA MER VICTOR K
 6-609
 LAMP BEVERLY
 6-1120
 LAMPORT JUANITA
 6-35
 LANDAU H G
 6-768
 LANE I R JR
 6-1236
 LANE J A
 6-1188
 LANG A R
 6-1291
 LANG FRANCES S
 6-889 6-1468
 LANG FREDERICK R
 6-1106
 LANGENDORFF H
 6-53
 LANGER LAWRENCE M
 6-1914
 LANGHAAR HENRY
 6-1204
 LANGLEY AERONAUTICAL LAB
 NACA
 6-899
 LANGLEY MEMORIAL
 AERONAUTICAL LAB NACA
 6-865 6-1711
 LANKENAU HOSPITAL
 RESEARCH INST
 6-760 6-761 6-792
 6-794
 LANSING NEAL F
 6-1186 6-1323
 LANTER ROBERT J
 6-1492
 LANZL L H
 6-1036
 LARK-HOROVITZ KARL
 6-557 6-1349
 LARKINS JOHN H
 6-959
 LARKINS LOUISE
 6-762
 LARKS S D
 6-783
 LARSEN EDWIN M
 6-99
 LASCoux JEAN
 6-432
 LASLETT L JACKSON
 6-1028 6-1531 6-1532
 LASSEN N O
 6-394
 LAST GEORGE A
 6-890 6-894
 LAUDERDALE H A
 6-1610
 LAURENT H
 6-845 6-1598
 LAVIK PAUL S
 6-659 6-1378
 LAWRENCE ERNEST O
 6-1834
 LAWRENCE J H
 6-497
 LAWSON J D
 6-1027
 LAWSON JAMES
 6-1883
 LEAR H
 6-329
 LEBLANC J M
 6-739
 LEBLANC MAURICE
 6-197
 LE COUTEUR K J
 6-1336
 LEE H T
 6-229
 LEE HELEN M
 6-1447
 LEFORT MARC
 6-143 6-146 6-877
 LEGRAS JEAN
 6-1718
 LEITH C E
 6-655
 LELAND W T
 6-1574
 LELEVIER R E
 6-321
 LEONARDS JACK R
 6-1378
 LEONTIS T E
 6-903
 LEPORE J V
 6-918 6-975
 LEPSIUS RICHARD
 6-685
 LEVA MAX
 6-1719
 LEVER F M
 6-1692
 LEVEY GERRIT
 6-1659
 LEVIN DANIEL H
 6-1112
 LEVINE ROBERT
 6-91
 LEVINGER J S
 6-728
 LEVINTOV I I
 6-260
 LEVITSKAYA M A
 6-1053
 LEVITT ARNOLD E
 6-1143
 LEVY F
 6-672
 LEVY HARRIS B
 6-414
 LEVY HENRI A
 6-482 6-619
 LEVY MAURICE M
 6-747
 LEWIS ALVIN E
 6-13 6-37 6-765
 6-1617
 LEWIS FLIGHT PROPULSION
 LAB NACA
 6-860 6-866 6-867
 6-1496 6-1712 6-1713
 LEWIS G M
 6-307
 LEWIS H W
 6-1497
 LEWIS W B
 6-355
 LICHTSTEIN HERMAN C
 6-29
 LICHTBLAU H
 6-1485
 LIDDEL URNER
 6-1672
 LIEBERMAN D S
 6-600 6-1238
 LINDEMANN BRUNO
 6-778
 LINDENBAUM ARTHUR
 6-77 6-1615 6-1616
 LINDER C T
 6-1484
 LINDSTROM GUNVAR
 6-995
 LINEIKIN P S
 5-623
 LINGANE JAMES J
 6-1138
 LIPKIN HARRY J
 6-356
 LIPPS F
 6-688
 LIPSCOMB WILLIAM N
 6-550
 LISTER B A J
 6-844
 LITTON F B
 6-1241
 LIU YU CHENG
 6-170
 LIVINGOOD C S
 6-797
 LIVINGSTON RALPH
 6-482 6-1308 6-1673
 LOCK W O
 6-259 6-1826
 LOCKHART HELEN S
 6-654
 LOEWE S
 6-141
 LOFTNESS R L
 6-1734
 LOLIGER H
 6-1A50

NUCLEAR SCIENCE ABSTRACTS

LOMONT JOHN S
6- 744
LONCHAMP JEAN-PIERRE
6- 397
LONDON A L
6-1709
LONG ISLAND BIOLOGICAL
ASSN COLD SPRING
HARBOR
6- 8
LOOMIS F
6-1422
LORENZ EGON
6- 57 6-1082 6-1607
LORIERIS JEAN
6-1435 6-1584
LORING B M
6- 596
LORRIS S G
6- 595
LOS ALAMOS SCIENTIFIC
LAB
6- 30 6- 191 6- 294
6- 334 6- 505 6- 593
6- 762 6- 805 6- 937
6- 948 6- 949 6- 950
6- 955 6- 959 6- 930
6- 999 6-1206 6-1217
6-1390 6-1462 6-1465
6-1492 6-1503 6-1526
6-1651 6-1682 6-1729
6-1731 6-1773 6-1774
6-1778 6-1789 6-1796
6-1797 6-1799 6-1830
6-1852
LOS J M
6- 154 6- 944
LOUIE BERNICE JUE
6-1369
LOUISIANA STATE UNIV
6-1635
LOUISVILLE UNIV
6- 851 6-1177 6-1193
LOUVIERE L J
6- 527
LOUWERSE P
6-1275
LOVELL CALVIN H
6-1180
LOVINGTON J A
6- 359
LOW J R JR
6-1730
LOW WILLIAM
6- 340
LOWAN ARNOLD N
6-1714
LOWDERMILK WARREN H
6- 866
LOWDIN PER-OLOV
6-1502
LOWRIE R S
6- 180
LUBARSKY BERNARD
6-1712
LUCKE CHARLES E
6- 489 6- 490
LUCKS C F
6- 915
LUDWIG GUNTHER
6-1370
LUKYANOVICH V M
6- 95
LUMRY RUFUS
6- 498 6- 540
LUNBECK R J
6- 128
LUNDHOLM JOE JR
6- 192
LUNING K G
6- 773
LYMAN E M
6-1035 6-1036 6-1037
LYNCH V H
6- 14 6- 167
LYON RICHARD N
6-1201
LYON THOMAS P
6- 19
MABBOUX CLAUDE
6-1827
MCADAMS GEORGE B
6-1104
MCBEE E T
6- 465
MCCALL D W
6- 351
MCCLURE JOHN HIBBERT
6- 157
MCCONNELL K P
6- 797
MCCUE J J G
6- 359 6- 360 6-1877
MCCUSKER C B A
6- 269 6- 270 6- 613

MCDANIEL B D
6- 479
MCDERMID W L
6- 638 6- 648 6- 649
6- 650 6- 651
MCDIARMID I B
6-1293
MACDONALD N
6- 859
MACDONALD NORMAN S
6- 69 6- 70
MCDUFFIE B
6-1565
MACE W
6-1236
MCELROY W D
6- 6
MCGINNIS CLARE M
6- 816
MCGINNIS WILLIAM J
6-1171
MCGOWAN F K
6-1555
MCGUIRE T R
6-1943
MACHLIN E S
6- 594
MCINDOE W V
6- 112
MACK R A
6-1025
MCKAY KENNETH G
6-1044 6-1045
MACKENZIE K R
6-1901
MCKEWAN WILLIAM
6- 896
MACKAY JAMES
6- 41
MCKINNEY D S
6- 597
MACKLIN R L
6- 354
MCMAHON J B
6- 485
MCMASTER RACHEL D
6- 43
MCMILLAN EDWIN M
6-1835
MCMINN WILLIAM O
6-1010
MCPHERSON D J
6- 591
MCQUILLAN MARION K
6-1259
MCQUITT Y J B
6- 945
MCWEENEY R
6-1347
MADANSKY LEON
6- 688 6- 689 6-1917
MADDER ROBERT E
6- 565
MADDIN R
6-1736 6-1742
MADDOCK A G
6-1167
MADEY RICHARD
6- 323
MAEDER D
6- 434 6-1923
MAGAT MICHEL
6- 144 6- 836
MAGEE ROBERT J
6- 825 6- 848
MAGER L
6- 618
MAGES PHILIP S
6- 87
MAIENSCHNEIN F C
6- 647
MAIER L C JR
6- 377
MAISIN J
6-1587 6-1588
MAJOR JOHN KEENE
6- 427
MAJOR MARY H
6-1078
MAKAROV E S
6- 242
MALCOLM E D
6- 246
MALIK JOHN STANLEY
6- 380
MALLETT LUCIEN
6-1614
MALLETT M W
6- 898
MALLORY H DEAN
6-1664
MALM R E
6- 405
MAMASAKHLISOV V I
6-1334

MANKIEWICZ WANDA
6- 12
MANN A K
6- 706
MANN KINGSLEY M
6-1181
MANN L G
6-1051
MANOWITZ B
6-1552
MARANS N S
6- 130
MARAPODI PETER F E
6-1019
MARCHEL GEORGES
6-1614
MARCUS P M
6-1371 6-1372
MARKAKIS P C
6- 511
MARKOV M A
6-1368
MARMIER P
6- 367 6-1021 6-1022
MARSH J K
6- 842
MARSHAK R E
6- 408 6- 973 6-1819
6-1820
MARSHALL E D
6- 855
MARSHALL J
6-1883
MARSHALL LAWRENCE M
6-1696
MARTENS HOWARD E
6-1231 6-1233 6-1249
MARTIN AARON J
6-1638 6-1784
MARTIN D C
6- 227
MARTIN D W
6- 739
MARTIN DON S JR
6-1504
MARTIN J J
6- 916
MARTIN J ROBERT
6-1406
MARTLAND HARRISON S
6- 787
MARTY CLAUDE
6-1042 6-1306
MASKET A V
6-1319
MASSACHUSETTS INST OF
TECH
6- 120 6- 204 6- 205
6- 251 6- 594 6- 595
6- 598 6- 618 6- 676
6-1199 6-1282 6-1433
6-1443 6-1448 6-1449
6-1467 6-1470 6-1471
6-1516 6-1517 6-1518
6-1519 6-1520 6-1745
MASSING WERNER
6- 811
MASTOVSKY OTAKAR
6-1067
MATERIAL LAB NEW YORK
NAVAL SHIPYARD
6-1800
MATHESON MAX S
6-1677
MATTHEWS JO CE J
6-1386
MATTHEWS MARION
6-1082
MAXWELL CHARLES R
6-1421
MAXWELL E
6-1748
MAY JOHN E
6-1878
MAYER MARIA JOEPPERT
6-1838 6-1839
MAYKUTH D J
6- 908 6-1732
MEDALIA A I
6- 85 6- 582 6-1182
MEDICAL CLINIC PETER
BENT BRIGHAM HOSPITAL
6- 7 6- 9
MEDICAL RESEARCH COUNCIL
GREAT BRITAIN
6-1024
MEHL ROBERT F
6- 599
MEINKE W W
6- 916
MEINKE W WAYNE
6-1397 6-1685
MEITES LOUIS
6-1151

AUTHOR INDEX

MEITES THELMA
6-1151
MEITNER LISE
6-1675
MENEFLY JOHN K JR
6-15
MERTENS ROBERT
6-398
MESSER HARRY
6-269 6-516 6-753
METALLOY CORP
6-166
METALLURGICAL LAB
UNIV OF CHICAGO
6-732 6-1710
METALLURGICAL LABS
SYLVANIA ELECTRIC
PRODUCTS INC
6-602 6-603
METALLURGICAL PROJECT
UNIV OF CHICAGO
6-731
METALS CORROSION LAB
BUREAU OF MINES
6-1236
METALS RESEARCH LAB
CARNEGIE INST OF TECH
6-599 6-601 6-1473
METLAY MAX
6-1469
MEYERHOF W E
6-1051
MICHAELSON HERBERT B
6-602
MICHEL LOUIS
6-1062
MICHELS A
6-1275
MICHIGAN STATE COLL
6-529
MICHIGAN UNIV
6-81 6-82 6-83
6-84 6-102 6-1207
6-1685
MICROWAVE LAB
STANFORD UNIV
6-1488 6-1545
MIDDLETON R
6-708
MIKUMO TAKASHI
6-1501
MILHAUD M
6-524
MILLAR D D
6-270
MILLARD B
6-1425
MILLEN T S
6-198
MILLER ARTHUR
6-660
MILLER C PHILLIP
6-784 6-1384
MILLER CARL F
6-560 6-839 6-840
MILLER CHARLES E
6-929
MILLER CHRISTINA C
6-825 6-848
MILLER D H
6-316
MILLER EARL R
6-67
MILLER G L
6-913
MILLER H W
6-105
MILLER HUGH H
6-1163
MILLER J M
6-360 6-700
MILLER M M
6-1352
MILLER R R
6-1444
MILLER SCHOOL OF BIOLOGY
UNIV OF VIRGINIA
6-111
MILLER W T
6-459 6-1566
MILLIGAN L H
6-887
MILLIGAN W O
6-1409
MILLINGTON RUTH H
6-792
MILLS E C
6-1407
MILLS M M
6-1056 6-1322
MILNER C J
6-584
MINDER W
6-1169
MINISTRY OF SUPPLY
GREAT BRITAIN
6-756 6-757 6-938
MINNESOTA MINING AND
MANUFACTURING CO
6-1701
MINNESOTA UNIV
6-499 6-750 6-891
6-1073 6-1085 6-1503
MIRGALOVSKAYA M S
6-243
MISCH R D
6-225
MISKEL JOHN A
6-1015
MISRA B
6-579
MISSOURI UNIV
6-1446
MITCHEL HERSCHEL K
6-767
MITCHELL ALLEN C S
6-1909
MITCHELL DAVID W
6-202
MITCHELL E N J
6-1404
MITOFF STEPHEN P
6-202
MIZUSHIMA JASATAKA
6-1445
MOBIUS WILFRIED
6-1381
MOCH IRVING JR
6-1738
MOLNAR J P
6-947
MONAHAN JAMES
6-954
MONCHICK LOUIS
6-1121
MONDOLFO L F
6-907
MONK A T
6-1710
MONK C B
6-100
MONTEFIORE HOSPITAL
NEW YORK
6-1074
MONTILLON G H
6-1663
MOODY N F
6-1495
MOORE GEORGE E
6-1689
MOORE J H
6-223
MOREL FRANCOIS
6-1622 6-1623
MORELLET DANIEL
6-1427
MORGAN KARL Z
6-1 6-1095
MORRIS L D
6-936
MORRISH A H
6-1765
MORRISON A
6-1102
MORRISON D C
6-92 6-93
MORRISON J A
6-154 6-944
MORRISON P
6-1582
MORTON G A
6-935
MORTON JOSEPH L
6-1103
MORTON ROY J
6-54 6-1212
MOSBACH E H
6-178 6-1520
MOSES M J
6-1374
MOSHINSKY MARCOS
6-682 6-683
MOSHMAN J
6-1117
MOTT B W
6-1228
MOTZ HENRY T
6-1530 6-1553
MOTZ J W
6-998
MOUND LAB
6-645 6-960 6-1278
6-1432
MOYER B J
6-362 6-788 6-670
MUEHLHAUSE C O
6-1286
MUENDEL C H
6-1670
MUIRHEAD E G
6-1445
MUIRHEAD H
6-259 6-1550
MULRYAN H J
6-21 6-22
MULVEY J H
6-341
MUNN JOHN I
6-494
MURRAY JAMES A
6-1437
MURRAY MARVIN
6-529
MURRAY RAYMOND L
6-932
MURTY D S N
6-1150
MUSSER ROBERT J
6-1199
MYERS VERNON
6-1551
NACHTRIEB NORMAN H
6-1395
NAGELSEN MARGARET G
6-1377
NAGY JOHN
6-1627
NAIRN J S
6-639
NAKAMURA SEITARO
6-740 6-1356
NAKANISHI MASAKI
6-1403 6-1404
NAKAO AKIRA
6-1387 6-1509
NARBUTT K I
6-138
NASH R R
6-888
NASH W F
6-257
NATAF ROGER
6-1941
NATIONAL ACADEMY OF
SCIENCES
6-210
NATIONAL BUREAU OF
STANDARDS
6-295 6-888 6-998
6-1279 6-1429 6-1430
6-1497 6-1700 6-1735
6-1748
NATIONAL CANCER INST
6-1082
NATIONAL PHYSICAL LAB
GREAT BRITAIN
6-675
NATIONAL RESEARCH CORP
6-223
NATIONAL RESEARCH
COUNCIL OF CANADA
6-864 6-1536 6-1537
NATIONAL RESEARCH
COUNCIL OF CANADA DIV
OF BUILDING RESEARCH
6-1416
NAUGLE J E
6-1266
NAVAL ENGINEERING
EXPERIMENT STATION
ANNAPOLIS
6-182 6-203
NAVAL MEDICAL RESEARCH
INSTITUTE BETHESDA
6-494 6-527 6-1097
6-1376
NAVAL MEDICAL RESEARCH
STATION JOINT TASK
FORCE ONE
6-32
NAVAL ORDNANCE LAB
6-1714
NAVAL RADIOLOGICAL
DEFENSE LAB
6-23 6-1593 6-1594
NAVAL RESEARCH LAB
6-89 6-232 6-595
6-885 6-946 6-1218
6-1237 6-1510
NAVAL RESEARCH LAB
UNIV OF WISCONSIN
6-286
NAVAL SCHOOL OF AVIATION
MEDICINE PENSACOLA
6-1596
NEBRASKA UNIV
6-1339
NEEB H CHR
6-217 6-218
NELSON C O
6-1630
NELSON D B
6-1630

NUCLEAR SCIENCE ABSTRACTS

NELSON H R
6- 898
NELSON JAMES A
6-1216
NELSON N Z
6- 833
NELSON R A
6- 389
NEMTSOVA V V
6- 95
NEPA DIV
6- 578 6- 546 6- 617
6- 900 6- 901
NEPA DIV FAIRCHILD
ENGINE AND AIRPLANE
CORP
6-1316 6-1447 6-1455
NERVIK W E
6-1344
NESBITT JOHN B
6- 515
NESBITT L B
6- 993
NESLAND A
6-1398
NEUFELD J
6- 34
NEUMAN W F
6- 21 6- 22
NEVILLE O KENTON
6-1122
NEVIN T E
6- 613
NEW BRUNSWICK LAB
6-1656 6-1657
NEW MEXICO UNIV
6-1206 6-1783
NEW YORK OPERATIONS
OFFICE AEC
6- 211 6- 528 6-1364
NEW YORK UNIV
6- 653 6- 677 6- 849
6-1392 6-1465 6-1597
6-1749 6-1840
NEWCOMBE R A
6- 849
NEWELL JOHN F
6- 858
NEWMAN JAMES R
6-1069
NEWMAN I E
6-1175
NEWS H C
6-1888
NEWTON GENE B
6- 629
NEWTON J O
6- 352
NEWTON J W
6- 71
NEWTON T W
6-1682
NICHOLS J L
6-1658
NICHOLS O
6-1606
NIEF G
6- 291
NIELSEN RICHARD L
6- 914
NIER A O C
6- 462
NIER ALFRED O
6- 991 6-1793
NIJGH G J
6- 420 6- 422
NIKOLSKII S I
6- 261
NOGGLE G R
6- 3 6- 101 6-1592
NORDHEIM GERTRUD P
6-1769
NORDMAN CHRISTER E
6- 350
NORMAN BRIDGE LAB OF
PHYSICS CALIF INST OF
TECH
6- 444 6- 446
NORMAND C E
6- 285
NORRIS T H
6-1626
NORRIS WILLIAM P
6- 28 6-1135
NORTH AMERICAN AVIATION
INC
6- 115 6- 815 6-1137
6-1152 6-1197 6-1222
6-1721 6-1734
NORTH CAROLINA STATE
COLL
6-1194 6-1446
NORTH CAROLINA UNIV
6-1219

NORTHWESTERN UNIV
6- 644
NORTON F H
6- 204 6- 205 6-1448
6-1449
NORTON G A
6- 407
NORTON JOHN T
6- 120
NOTRE DAME UNIV
6-1676
NOVEY T B
6-1047
NOVOBATZKY K F
6-1938
NOVOBILTSEV N S
6- 207
NOWATNY H
6-1126
NOYCE W K
6- 471 6- 472
NUCLEAR DEVELOPMENT
ASSOCIATES INC
6- 384 6-1285
NUCLEAR PHYSICS LAB
CASE INST OF TECH
6- 382 6-1543
NUSBAUM RALPH E
6- 69 6- 70 6- 108
NUSSEBAUM R H
6- 420
NYSTROM ROBERT F
6-1181
OAK RIDGE INST OF
NUCLEAR STUDIES
6-1146
OAK RIDGE NATIONAL LAB
6- 1 6- 2 6- 3
6- 4 6- 5 6- 24
6- 25 6- 26 6- 27
6- 29 6- 34 6- 45
6- 46 6- 47 6- 48
6- 49 6- 101 6- 111
6- 140 6- 149 6- 149
6- 150 6- 162 6- 180
6- 185 6- 192 6- 217
6- 293 6- 330 6- 409
6- 441 6- 533 6- 577
6- 643 6- 781 6- 843
6-1070 6-1071 6-1073
6-1077 6-1078 6-1079
6-1080 6-1092 6-1093
6-1094 6-1095 6-1108
6-1110 6-1111 6-1115
6-1134 6-1163 6-1172
6-1186 6-1188 6-1189
6-1190 6-1192 6-1201
6-1212 6-1213 6-1261
6-1288 6-1320 6-1327
6-1360 6-1482 6-1485
6-1499 6-1511 6-1515
6-1548 6-1549 6-1553
6-1561 6-1591 6-1592
6-1598 6-1599 6-1610
6-1612 6-1625 6-1648
6-1649 6-1697 6-1729
6-1777 6-1856
OAK RIDGE NATIONAL LAB
Y-12 AREA
6- 272 6- 285 6- 694
6- 695 6- 860 6- 870
6- 952 6- 953 6-1000
6-1791 6-1882
OBERSTE-LEHN HARALD
6- 64
ODELL FRANCIS
6- 209
OFFICE OF NAVAL RESEARCH
LONDON
6- 448 6-1371 6-1372
6-1522 6-1523
ORDEN H R
6- 908 6-1732
OGIEVETSKII V I
6-1041
OGLE W E
6-1799
OLD AND BARNES INC
6- 403
OLIVER A J
6- 298
OLIVER GEORGE D
6-1158 6-1159
ONODA KIYOKO
6-1453
ONSTOTT E I
6-1651
OPECHOWSKI W
6- 350
OPINSKY A J
6-1154 6-1155
OPP KARL
6-1643 6-1661

OPPENHEIM ALAN
6- 384
ORCEL JEAN
6-1461
ORFAR JAY
6-1754 6-1793 6-1818
6-1819 6-1833 6-1839
6-1859 6-1860 6-1861
6-1883 6-1887 6-1909
6-1931
OREGON STATE COLL
6-1626 6-1650
OREGON UNIV
6- 59 6-1450
ORKIN-LECOURTOIS AGNES
6-1827
ORTEL
6- 880
ORTH DONALD
6- 736
OSBORN PAUL V
6-1443
OSIPOV K A
6- 909
OSTLING GUSTAF
6-1105
OUELLET C
6- 631
OVERSTREET R
6-1422
OWEN LOUIS E
6-1145
PAASCHE O G
6-1229
PAGE E L
6- 868
PACKARD M E
6-1671
PAEHLER J H
6-1456
PAGE WILLIAM R
6-1199
PALMER PHYSICAL LAB
PRINCETON UNIV
6-1305 6-1794 6-1801
6-1811
PANOFSKY H A
6- 677
PANOFSKY WOLFGANG K H
6- 317 6- 362 6- 475
PAPP C A
6- 498
PARIS RENE
6-1141
PARKER E R
6-1733
PARKER J R
6- 638 6- 648 6- 649
6- 650 6- 651 6- 652
PARLIN RANSOM J B
6- 620 6-1537
PARNANEN P O
6- 775
PARSEGLIAN V L
6-1715
PARTRIDGE WILLIAM S
6- 620
PARVIAINEN S
6- 775
PARZEN G
6- 933
PASCAUD CLAUDE
6- 607
PASK JOSEPH A
6- 201 6- 202
PASKIN ARTHUR
6-1A58
PATERSON EDITH
6-1386
PAUL M
6-1A60
PAYNE P R
6-1088
PEACOCK J M
6- 564
PEARCEY T
6- 939 6- 940
PEARLSON W H
6-1701
PEARSON HAROLD E
6- 72
PEARSON W B
6-1476
PEEBLES F N
6-1440 6-1441
PEEK HARRY MILTON
6-1773
PEELLE R W
6-1A01
PEIERLS R E
6-1754 6-1859
PEIRSON D H
6- 590

AUTHOR INDEX

PELLAS PAUL
 6-1225
 PENNER S S
 6-1438
 PENNSYLVANIA STATE COLL
 6- 200 6- 234 6- 538
 6- 806 6- 807 6- 808
 6-1631 6-1633 6-1634
 6-1638 6-1639 6-1640
 6-1784
 PENNSYLVANIA STATE COLL
 SCHOOL OF MINERAL
 INDUSTRIES
 6- 116 6- 117 6- 118
 6- 119
 PEKOWITZ L P
 6- 106 6- 107 6- 592
 PEPPER T P
 6-1886
 PERFETTI BRUNO M
 6- 91
 PERKINS D H
 6- 259
 PERLMAN I
 6- 413 6- 414 6- 415
 PERLMAN M L
 6-1792
 PERLOW GILBERT J
 6- 612
 PERMINGEAT FRANCOIS
 6-1460
 PERNEGR J
 6-1267 6-1297
 PERRINGS J D
 6- 30 6- 762
 PERRY ALFRED MORRIS JR
 6-1534 6-1546
 PERSIANI PAUL J
 6- 958
 PERSICO ENRICO
 6- 749
 PETERMANN A
 6- 458
 PETERMANN MARY L
 6-1074
 PETERS B
 6- 925
 PETERS HORST
 6-1683
 PETERSON DOROTHY C
 6-1421
 PETERSON S W
 6- 619
 PETIAU GERARD
 6- 752 6-1333 6-1563
 PETRETIC G J
 6-1657
 PETRIE D P R
 6-1026
 PETSCHKE A G
 6- 408
 PEYROU C
 6-1298
 PHAIR GEORGE
 6-1453
 PHARES E F
 6- 178 6- 532 6-1620
 PHELPS ARTHUR V
 6-1490
 PHILLIPS G
 6- 576
 PHILLIPS J A
 6- 955
 PHILLIPS K
 6-1539 6-1808
 PHILLIPS MICHAEL D
 6-1377
 PHILLIPS R
 6- 362
 PIATIER H
 6-1156
 PICARD E
 6-1265
 PICCIRILLO RONALD T
 6- 36
 PICHAT L
 6-1699
 PICKAVANCE T G
 6-1883 6-1887
 PICKLE C B
 6-1777
 PICKUP E
 6-1761 6-1807
 PIERCE FRANK T
 6- 38
 PIETRUCK CHRISTEL
 6- 846 6- 847
 PIGG J C
 6-1281 6-1349
 PIKE R
 6-1429
 PILZ W
 6-1402
 PITTSBURGH UNIV
 6- 91 6- 235 6-1472
 6-1632 6-1554
 PLACAK OLIVER R
 6- 54
 PLAN MAX
 6-1717
 PLUCKNETT WM C
 6- 275
 PLUNKETT R L
 6- 803
 PLUVINAGE P
 6-1063
 POCHAPSKY T E
 6- 580
 POEL L W
 6-1703
 POLLOCK FRANKLIN
 6- 451
 POMERANCHUK I YA
 6- 326
 POMEHAT C M
 6- 797
 PUMPER SEYMOUR
 6-1591
 POND T A
 6-1305
 POOL M L
 6- 705
 PORTER PAUL EDWARD
 6- 558 6- 562 6- 563
 PORTER PHILIP K
 6- 876
 POSS H L
 6-1525
 POTTER DAVID S
 6- 929
 POTTER E V
 6- 862
 POULSON D F
 6-1114
 POWELL A R
 6-1692
 POWELL C F
 6-1328 6-1329
 POWELL J E
 6- 561 6-1590
 POWELL W M
 6- 478
 POWER E A
 6-1301
 PRANATIS A
 6- 601
 PRAY H A
 6- 273
 PRAYTOR E H
 6- 31
 PREISER STANLEY
 6- 384
 PREISWERK P
 6- 419 6- 434 6-1876
 6-1923
 PRESBYTERIAN HOSPITAL
 CHICAGO
 6- 565
 PRESCOTT C H JR
 6- 466
 PRESCOTT J R
 6-1915
 PRESENT R D
 6-1840
 PRESSMAN DAVID
 6-1113
 PRESTON M A
 6-1554
 PRESTON W M
 6- 359 6- 368 6-1877
 PRICE ROBERT
 6-1781
 PRIEDIGKEIT J
 6-1575
 PRIMAK W
 6-1260
 PRINCETON UNIV
 6- 90 6- 447 6-1166
 6-1400 6-1555
 PRINGLE R W
 6-1916
 PRINGSHEIM PETER
 6-1427
 PRITCHARD F W
 6- 875
 PROCTOR B E
 6- 511
 PROCTOR W G
 6-1018 6-1895
 PROSSER H C
 6-1792
 PRUETT C H
 6-1352
 PRUGNE PIERRE
 6-1725
 PRZIBRAM KARL
 6- 142
 PUERTO RICO UNIV
 6- 610
 PURDUE UNIV
 6-1840
 PURSEY D L
 6- 366
 QUERIDO A
 6- 323
 QUILL LAURENCE L
 6-1174
 QUINTON A
 6-1332
 QUIRK J F
 6- 884
 RABBITT JOHN C
 6-1454 6-1455
 RABINOVITCH B S
 6- 828
 RABINOWITZ J
 6- 174
 RACAH GIULIO
 6-1621
 RACHINSKII V V
 6-1621
 RADIATION LAB
 UNIV OF CALIF
 6- 14 6- 38 6- 92
 6- 93 6- 123 6- 152
 6- 153 6- 167 6- 168
 6- 254 6- 273 6- 284
 6- 288 6- 297 6- 298
 6- 299 6- 317 6- 318
 6- 319 6- 320 6- 321
 6- 322 6- 323 6- 324
 6- 357 6- 361 6- 362
 6- 363 6- 364 6- 378
 6- 379 6- 386 6- 387
 6- 388 6- 389 6- 390
 6- 410 6- 411 6- 412
 6- 413 6- 414 6- 415
 6- 416 6- 495 6- 496
 6- 497 6- 521 6- 571
 6- 629 6- 655 6- 656
 6- 669 6- 670 6- 671
 6- 686 6- 687 6- 701
 6- 702 6- 703 6- 715
 6- 716 6- 717 6- 718
 6- 736 6- 737 6- 809
 6- 817 6- 818 6- 831
 6- 832 6- 850 6- 852
 6- 854 6- 861 6- 917
 6- 918 6- 941 6- 962
 6- 963 6- 974 6- 975
 6-1004 6-1005 6-1006
 6-1030 6-1324 6-1326
 6-1344 6-1389 6-1481
 6-1512 6-1538 6-1536
 6-1641 6-1703 6-1753
 6-1790 6-1821 6-1834
 6-1835 6-1841 6-1862
 6-1863 6-1864 6-1865
 6-1866 6-1927
 RADIO CORP OF AMERICA
 6- 638
 RADIOPHYSICS LAB
 UNIV GROUNDS SYDNEY
 AUSTRALIA
 6- 939 6- 940
 RADISHCHEV V P
 6- 96
 RADUSHKEVICH L V
 6- 95
 RAE E R
 6- 440
 RAFELSON MAX E JR
 6- 72
 RAIEVSKI V
 6- 697
 RAINWATER JAMES
 6- 976
 RAINWATER L J
 6- 984
 RALL WALDO
 6-1878
 RAMSEY N F
 6-1025
 RAMSEY NORMAN F
 6- 336 6-1572 6-1828
 RAMSEY W E
 6- 310
 RAMSKILL EUGENE A
 6- 517
 RAND CORP
 6-1589 6-1709
 RANDLE T C
 6- 376
 RANKIN BAYARD
 6- 378
 RANZ W E
 6-1708

NUCLEAR SCIENCE ABSTRACTS

RAO BH S V RAGHAVA
6- 113 6- 823 6-1146
6-1147 6-1148 6-1150
RAO C LAKSHMAN
6- 113 6-1148
RAPOPORT HENRY
6-1180
RAPOPORT L P
6-1053
RAPP KARL E
6-1160
RAPPOPORT I D
6- 261
RASMUSSEN JOHN OSCAR JR
6- 353 6- 410 6- 412
6-1556
RASMUSSEN R T C
6-1727
RASMUSSEN V K
6-1010
RATIER J
6- 977
RAUMANN GERTRUD
6-1775 6-1776
RAVENHALL D 3
6-1425
RAVERY MICHAEL
6-1240
RAY W E
6- 234
RAYSKI J
6- 751
RCA LABS DIV RADIO
CORP OF AMERICA
6- 935
RCA VICTOR DIV
RADIO CORP OF AMERICA
6- 648 6- 649 6- 650
6- 651 6- 652
READ H J
6- 234
READ T A
6- 600 6-1238
REDDEN THOMAS
6- 238
REED S K
6-1566
REGENSTREIF EDOUARD
6- 283
REID A F
6-1584
REID A T
6- 768
REID GEORGE W
6- 789
REID T R
6- 57
REIFENSTEIN ROBERT W
6- 9
REIFFEL L
6- 665 6-1810 6-1811
REILLEY CHARLES N
6- 574
REINDERS M E
6- 422
REINES F
6-1440
REINHART FRED M
6- 488 6-1735
REINSCH A J
6- 426
REISNER J H
6- 638 6- 648 6- 651
REMLEY M E
6- 966
RENGSTORFF G W P
6-1740
RENNER WILLIE
6- 55
RENSDELAER POLYTECHNIC
INST
6- 488
RESEARCH AND DEVELOPMENT
BOARD DEPT OF DEFENSE
6- 237
RESEARCH LAB OF
ELECTRONICS
MASS INST OF TECH
6- 253 6- 377 6- 548
6- 713 6-1490 6-1521
6-1541 6-1750 6-1751
6-1768 6-1770 6-1781
REST F G
6-1411
REYNOLDS C A
6- 920 6- 993
REYNOLDS DEXTER H
6-1206
REYNOLDS F L
6-1580
REYNOLDS FRED L
6- 415
REYNOLDS P
6-1467

RHODES BONNIE
6-1617
RIBE FRED L
6-1499
RICARD R
6-1017 6-1023
RICARD RAYMOND
6- 160
RICH T A
6-1581
RICHARDS ARCHER W
6-1724
RICHARDS H T
6-1459
RICHARDS P I
6-1283
RICHINGS H
6-1910
RICHMAN CHAIM
6- 669
RICHTER ESTHER
6- 508
RIDDIFORD L
6- 586 6- 714 6-1209
RIEGEL BYRON
6- 170
RIFKIN HAROLD
6-1074
RILEY HERBERT PARKES
6- 24 6- 26
RILEY RICHARD F
6- 508 6-1600
RINGO G R
6- 381 6- 579 6-1903
RITSON D M
6- 925 6-1489 6-1513
ROBB W L
6- 401
ROBERSON A H
6-1229
ROBERTS J E
6- 686
ROBERTS J H
6- 644
ROBERTS JOHN D
6- 416
ROBERTS L D
6-1485 6-1561
ROBERTSON K L
6-1499
ROBINSON BEROL L
6- 689 6-1917
ROBINSON F N H
6- 997
ROBINSON RADCLIFF F
6-1377
ROBINSON REX J
6-1149
ROBINSON ROBERT R
6- 796
ROBSON J M
6-1909
ROCHESTER UNIV
6- 327 6- 338 6- 385
6- 408 6- 925 6- 973
6-1029 6-1489 6-1513
6-1514 6-1534 6-1546
6-1547 6-1820
RODERICK H
6-1051
RODGER WALTON A
6- 518
RODICHEV V I
6-1366
ROESLER FRANK C
6-1205
ROGERS BETTY S
6-1390
ROGERS F T JR
6- 280
ROGERS HOWARD H
6-1133
ROGERS L B
6-1777
ROGERS MAX T
6- 125
ROGERS R R
6-1251
ROGERS R W
6- 293
ROGOZINSKI ANATOLE
6-1265 6-1245
ROHSENOW WARREN M
6-1443
ROLFENSTEIN ROBERT W
6- 7
ROLLIN B V
6- 255
ROMAN P
6- 333
ROMAND JACQUES
6- 879
ROMANN PAUL
6- 481

ROOT ROBERT E
6- 528
ROPP GUS A
6-1122
ROSE D C
6- 930
ROSE HORACE E
6- 919
ROSE J W
6- 701 6- 702
ROSE M E
6- 339 6-1844 6-1846
ROSEN L
6-1503
ROSENBLUM E S
6-1543
ROSENBLUM IRA
6-1104
ROSENBLUM SALOMON
6-1448
ROSENFELD A H
6-1754 6-1793 6-1818
6-1419 6-1833 6-1839
6-1459 6-1860 6-1861
6-1483 6-1887 6-1909
6-1931
ROSENTHAL ISADORE
6- 538 6-1639
ROSI F D
6- 603
ROSS M
6- 335
ROSS MARY H
6-1599 6-1612
ROSSEL J
6- 302
ROSWIT BERNARD
6- 68
ROTBLAT J
6-1328 6-1329 6-1330
6-1459 6-1869
ROTH E
6- 547
ROTHMAN ALAN
6- 597
ROTHWELL P
6- 393
ROUGEOT LOUIS
6-1292
ROUNDS DONALD E
6- 69 6- 70
ROWELL JOHN B
6- 499 6- 759 6-1073
6-1085
ROZENTAL I L
6-1270
RUBERT K F
6-1711
RUBIN B A
6-1086
RUBIN T
6- 469
RUBINSON A C
6-1114
RUCHHOFT C C
6- 519
RUDDY JOHN M
6-1373
RUDERMAN M
6- 318 6- 918
RUDMAN P S
6- 598 6-1467
RUDSTAM G
6-1462
RUGH ROBERTS
6-1604
RULFS CHARLES L
6-1397
RULON RICHARD M
6-1480
RUNNER MERVIN E
6- 552
RUSAKOVA LUKOVSKAYA N V
6- 244
RUSSELL LIANE BRAUCH
6- 45 6-1078
RUSSELL W L
6- 45 6-1078
RUSTAD B M
6- 288
RUTHERGLEN J G
6- 440
RUTLEDGE W C
6-1046 6-1907
RYTZ ALBRECHT
6- 438
SACHER GEORGE A
6- 784
SACHS FRANCES L
6- 110 6- 449 6- 905
SACHS R G
6- 335 6-1013

AUTHOR INDEX

SACKS JACOB
6-1399

SAGANE R
6-372 6-373

SAGE B H
6-1164

SAHIAR A B
6-978

ST CLAIR H W
6-862

ST LOUIS UNIV
6-954

SAKAKURA A Y
6-1459

SALAM ABDUS
6-746

SALANT E O
6-1525

SALERNO PAUL R
6-33

SALIKHOV S G
6-1359

SALISBURY W W
6-1324

SALPETER E E
6-1754 6-1936 6-1937

SALSBERG ZEVI W
6-1773

SALTER WILLIAM T
6-1104

SALUNINA A E
6-206

SALUTSKY MURRELL L
6-1174

SALVETTI C
6-1934

SAMPSON M B
6-1010 6-1011

SAMS ELTON W
6-867

SANDS M L
6-1578

SANGREN WARD
6-1111

SARD ROBERT D
6-1759

SARGENT B W
6-1831 6-1854

SARROUY JEAN-LOUIS
6-636

SASMOR D J
6-868

SASTRI M L N
6-1929

SATO TAKUYA R
6-1135

SATTERTHWAITE C B
6-1472

SAUREFABRIK
SCHWEIZERHALL
SWITZERLAND
6-1944

SAWKILL J
6-1743

SAWYER B
6-601

SAWYER GEORGE ALANSON
6-369 6-955

SCADRON MARVIN D
6-1713

SCARBOROUGH JAMES M
6-275

SCATCHARD G
6-1471

SCHAEFER G
6-853

SCHAEFER HERMANN J
6-1596

SCHAFER HARALD
6-846 6-847

SCHARDT A W
6-1507

SCHERER KURT ERNST
6-1107

SCHEIN MARCEL
6-267

SCHELBERG A D
6-1565

SCHERER M
6-1296

SCHERRER P
6-1021 6-1022

SCHIESSLER ROBERT W
6-122

SCHIFF DAPHNE
6-664

SCHIFF L I
6-1488 6-1545 6-1819

SCHJEIDE OLE ARNE
6-36

SCHLAER HANS LUDWIG
6-1645 6-1647

SCHLAIN D
6-1236

SCHLENCK HERMANN
6-1120

SCHLENK F
6-112 6-1072

SCHLIVITCH SRETEN
6-301

SCHLUTER R A
6-1754 6-1793 6-1818
6-1819 6-1833 6-1839
6-1859 6-1860 6-1861
6-1883 6-1887 6-1909
6-1931

SCHMID H
6-570

SCHMID K
6-570

SCHMIDT GERHARD
6-52

SCHNEIDER E E
6-834

SCHNEIDER H
6-1925

SCHNEIDER W
6-66

SCHOMAKER VERNER
6-136 6-554

SCHRADER ALAN R
6-203

SCHRODINGER ERWIN
6-615

SCHUBERT CLARENCE C
6-1674

SCHUBERT JACK
6-76 6-77 6-1615
6-1616

SCHUCK EDWARD A
6-13 6-37 6-765

SCHULER ROBERT H
6-1674

SCHULMAN J H
6-1510

SCHULZ ALVIN G
6-324 6-671

SCHUMB WALTER C
6-1133

SCHWARTZ DREW
6-2

SCHWARTZ J W
6-1549

SCHWARTZ M A
6-578

SCHWARZ-BERGMANN ERICH
6-874

SCHWEBEL A
6-1430

SCHWEICKERT C E
6-273

SCHWEMIN A J
6-861

SCHWETZOFF VLADIMIR
6-879

SCHWINGER JULIAN
6-690

SCOTT E J
6-800

SCOTT F R
6-1050

SCOTT JAMES K
6-528

SCOTT K G
6-1422

SCOTT M B
6-1035 6-1036 6-1037

SCOTT WILLIAM T
6-383

SCULLY NORBERT J
6-163

SEABORG GLENN T
6-284 6-416

SEAGRAVE JOHN D
6-1879

SEAY W A
6-965

SEDGWICK LABS OF
SANITARY SCIENCE
MASS INST OF TECH
6-515

SEGRE E
6-474 6-1887

SEIFERT H S
6-1066

SEIGLE L L
6-598

SEKI S LOUISE
6-1084

SELDAM C A TEN
6-128

SELKE W A
6-1431 6-1670

SELLE W A
6-1380

SEMMEL J W
6-600

SEMMENS R D
6-181

SENFLEBEN HERMANN
6-1202

SEPTIER ALBERT
6-1642

SERBER ROBERT
6-1816 6-1819

SERIN B
6-920 6-993

SERVOMECHANISMS LAB
MASS INST OF TECH
6-296 6-407

SETLOW R B
6-1602

SEWELL CURTIS JR
6-1779

SEXL THEODOR
6-1043

SEYMOUR E F W
6-255

SHACTER BERNARD
6-1593 6-1594

SHAMOS M H
6-1758

SHANMUGADHASAN S
6-1933

SHAPIRO ANATOLE M
6-1823

SHAPIRO I S
6-983

SHARP D E
6-1419

SHARP M
6-230

SHARP W N
6-589

SHARPE J
6-956

SHAW D F
6-723

SHAW J C
6-527

SHCHERBAKOV D I
6-216

SHEEHAN J P
6-902

SHEEHAN WILLIAM F JR
6-554

SHELTON EMMA
6-57

SHEPPARD C W
6-1077 6-1111

SHER R
6-706

SHERBY OLEG D
6-231 6-1235

SHERMAN BEILA
6-1113

SHERMAN D F
6-322

SHERMAN NOAH
6-1756

SHERR R
6-1911

SHERRY E V
6-1431

SHERWIN CHALMERS W
6-1909

SHERWOOD A M
6-764

SHEWCHUCK SERGEY
6-917 6-962 6-963
6-1005 6-1006 6-1324
6-1481 6-1512 6-1753
6-1834

SHIRLEY E L
6-107

SHIROKOV YU M
6-457

SHOEMAKER F C
6-1794

SHONKA F R
6-1506

SHOOLERY J N
6-554

SHORTER GERTRUDE
6-784

SHPINEL V S
6-742

SHULL C G
6-1038 6-1548

SHULL HARRISON
6-256

SHULMAN R G
6-554

SHUTT R P
6-315 6-316 6-1817

SIBERT MERLE E
6-236 6-1737

SIEFFERT L E
6-126

NUCLEAR SCIENCE ABSTRACTS

SIEGBAHN K
6-1A39
SIEGEL R
6-1771
SILSBEE H B
6-255
SILVERMAN A
6-1A72
SILVERMAN L
6-815 6-1137
SILVERMAN SOL R
6-1452 6-1744
SIMMEL E B
6-61
SIMON A
6-1A46
SIMON ROBERT H
6-1436
SIMONS J C
6-253
SIMONTON JOHN
6-19
SINCLAIR W K
6-525
SINDEBAND S J
6-120
SINEX F MAROTT
6-1652
SINGER I A
6-677
SINGER JOSEPH
6-1729
SINGER S FRED
6-1522
SISLER HARRY H
6-208
SJOSTRAND FRITIOF
6-766
SKAPERDAS GEORGE T
6-1720
SKOK JOHN
6-163
SKYRME D M
6-370
SKYRME T H R
6-1003
SLATER J C
6-253 6-377 6-713
6-733 6-1541
SLICHTER C P
6-351
SLIV L A
6-1064
SLOAN-KETTERING
INSTITUTE FOR CANCER
RESEARCH
6-566 6-1074 6-1112
6-1113
SMALLER B
6-1798
SMELLIER M S
6-112
SMITH ARTHUR H
6-796
SMITH COLL
6-383
SMITH F M
6-320
SMITH H S
6-1129
SMITH J E
6-642
SMITH L A
6-1012 6-1354
SMITH LINCOLN G
6-626
SMITH LUTHER
6-32
SMITH MAYNARD E
6-780
SMITH PHILIP BARTLETT
6-349
SMITH R D
6-440
SMITH RAYMOND L
6-812 6-1072
SMITH WARREN H
6-1531 6-1532
SMOLUCHOWSKI R
6-601 6-1153 6-1154
6-1155 6-1473 6-1660
SMULLIN L D
6-1770
SMYTH CHARLES P
6-131
SNELL ARTHUR H
6-1261 6-1859
SNOW A I
6-276
SNOW GEORGE A
6-1340 6-1525
SNOWDON S C
6-1795
SNYDER C W
6-1535

SNYDER HARTLAND S
6-292
SNYDER W S
6-34
SOBCZYK ANDREW
6-948 6-949 6-950
6-1726
SOMMER L H
6-130
SOMMERS HENRY S
6-1A30
SOMNA EDWARD H
6-1443
SONDHEIMER E H
6-1772
SORRENTINO JOSEPH
6-68
SOWDEN JOHN C
6-172
SPAIN PATRICIA
6-69 6-70
SPALDING CHARLES K
6-779
SPARGO B
6-1606
SPECTROSCOPIC LAB
UNIV OF CHICAGO
6-1302
SPEDDING F H
6-558 6-559 6-560
6-561 6-562 6-563
6-A39 6-840 6-1171
6-1464 6-1690
SPENDLOVE M J
6-862
SPERRY P R
6-1245
SPICER B M
6-1A85
SPIESS FRED NOEL
6-411
SPIGHEL MAURICE
6-1348
SPIES JOHN D
6-498 6-534 6-540
6-567
SPINKS J W T
6-968
SPIRO HOWARD H
6-7
SPIRITES MORRIS A
6-760 6-761
SPOERL EDWARD
6-771
SPONER H
6-1695 6-1769
STAHELIN P
6-419 6-1836
STAHL ADRIAN
6-1273
STAIR W K
6-577
STAKMAN E C
6-759 6-1085
STANDIL S
6-1916
STANDING K G
6-1A01
STANG L G JR
6-406
STANLEY ALFRED R
6-163
STAPLETON GEORGE E
6-47 6-49 6-1079
STARK H J
6-126
STAUB H H
6-1A50 6-1884
STAVELY HOWE E
6-163
STEAD F W
6-589
STEADMAN LUVILLE T
6-528 6-1089
STECKELMACHER W
6-582
STEEL W H
6-630
STEELE ROBERT
6-1115
STEENBERG N R
6-1A42
STEENLAND M J
6-921
STEFFENS KARL
6-65
STEIN GABRIEL
6-A35
STEINBERG E P
6-1327
STEINBERG MORRIS A
6-236 6-1737
STEINBERGER J M
6-328 6-329

STEINBERGER JACK
6-317
STEINHAUSER OTTMAR
6-824
STELLER JACK
6-317
STEPHAN E F
6-273
STEPHAN H R
6-901
STEPHEN R
6-324
STEPHENSON RICHARD
6-441
STEPKA W
6-167
STERN KURT H
6-84
STERN MARTIN O
6-717
STEUER WALTER
6-424
STEUDEL ANDREAS
6-693
STEVENS B P
6-798
STEVENSON DONALD T
6-1A43
STEVENSON P C
6-1344 6-1862
STIER PAUL
6-1549
STODDARD A E
6-739
STOKES RICHARD H
6-1028
STOKINGER HERBERT E
6-528 6-1089
STOKLAND K
6-217 6-218
STONE C A
6-665 6-1810 6-1811
STOREY R H
6-25 6-1117
STOUGHTON R W
6-1625
STOVALL E J JR
6-955
STRAIN HAROLD H
6-1135
STRANDBERG M W P
6-548 6-1521
STRASSMAN MURRAY
6-794
STRAUB CONRAD P
6-54
STREET J C
6-1760
STREET K JR
6-357
STREHLER BERNARD L
6-1134 6-1601
STRICK ELLIS
6-348 6-1418
STRIPEIKA ALEX J
6-629
STROMNAES OISTEIN
6-770
STROMQUIST W K
6-186
STROUD CATHERINE A
6-528
STUECKELBERG E C G
6-458
STURCKEN EDWARD F
6-954
STURDY G E
6-805
STURM WILLIAM J
6-985
STUTZ R E
6-164
STYRIKOVICH M A
6-871
SUDDATH J C
6-1092
SUESS H E
6-1754
SUGARMAN N
6-475 6-1860
SUITS C J
6-1317
SULLY A H
6-1246
SUMMERS-SMITH D
6-1256
SUPPLEE HELEN
6-1593 6-1594
SURDIN M
6-1265 6-1787 6-1788
SUTCLIFFE T
6-134
SUTTON J
6-156

AUTHOR INDEX

SUZOR FRANCIS
6-1355
SVEC HARRY J
6- 276 6- 573 6-1226
SVERDLOV L M
6- 137
SVIHLA G
6- 625
SWAIN A J
6-1257
SWAN G A
6- 169
SWANSON C P
6- 116
SWANSON DON R
6- 387
SWANSON MARJORIE A
6- 799
SWARTOUT J A
6-1320
SWARTZ C E
6-1466
SWENSSON J W
6- 161
SYLVANIA ELECTRIC
PRODUCTS INC
6-1474
SYLVESTER G E
6-1089
SYRACUSE UNIV
6- 924
SZASZ GEORGE J
6- 448

TABER KENNETH W
6- 58
TAHMISIAN T N
6- 502
TAI C T
6- 708
TAIEB JOSEPH
6- 635
TAKAHASHI Y
6- 674 6- 750
TAKEBE HISAO
6-1356
TAKETANI MITUO
6- 738 6- 740
TALBOYS ALBERT P
6- 883
TALIAFERRO L G
6-1375
TALIAFERRO W H
6-1375
TANG CHING-SIANG
6- 807 6-1639 6-1640
TANNENWALD P
6-1004
TASCHEK R F
6-1503 6-1859
TAUB JAMES M
6-1465
TAYLOR C J
6- 966
TAYLOR DENIS
6- 631
TAYLOR H W
6-1916
TAYLOR ISAAC M
6- 791 6- 793
TAYLOR J G V
6-1012 6-1354
TAYLOR J HERBERT
6- 149
TAYLOR JACK L
6-1243
TECHNICAL INFORMATION
SERVICE AEC
6- 491
TEILLAC JEAN
6- 418
TEITEL R J
6-1463
TELEGDI VALENTINE L
6- 704 6-1861
TELEP GEORGE
6-1405
TELLEZ-PLASENCIA
HELIODOSE
6-1681
TEMMER G M
6-1887
TEMMER GEORGES M
6- 749
TEMPLE UNIV
6- 760 6- 761 6- 792
6- 794
TEMPLETON CHARLES C
6- 81 6- 82 6- 83
6- 84 6- 102
TENDAM D J
6-1032

TENNESSEE UNIV
6- 5 6- 186 6- 293
6- 504 6-1321 6-1440
6-1441
TENNESSEE VALLEY
AUTHORITY
6- 11
TER-MARTIROSYAN K A
6- 374
TERRALL J R
6- 713
TERREAUX CH
6- 926
TERWILLIGER KENT M
6-1538
TEW J T
6-1075
TEWORDT L
6-1369
TEXAS AGRICULTURAL
EXPERIMENT STATION
6-1120
THEWLIS J
6- 121
THIELKE N R
6- 200
THIRRING W
6- 673
THODAY J M
6- 139
THOMAS ARBA
6-1139
THOMAS C O
6- 961
THOMAS E E
6-1870
THOMAS G E
6-1286
THOMAS J P
6-1350
THOMAS R C JR
6-1179
THOMAS R G
6-1873
THOMASEN L
6- 916
THOMPSON H W
6-1665 6-1565
THOMPSON P F
6-1624
THOMPSON R W
6-1565 6-1574
THOMPSON S G
6- 357 6- 410 6- 412
THOMPSON T J
6- 718
THOMPSON W B
6-1715
THOMPSON W E
6- 277
THORLEY N
6-1743
THORNDIKE A M
6- 315 6- 316 6-1817
TICHO HAROLD K
6-1351
TICKNOR L B
6-1471
TIMMERHAUS K D
6- 934
TINKHAM MICHAEL
6-1312
TITTERTON E W
6- 371 6- 707
TOBAILEM JACQUES
6-1357
TOBIAS CORNELIUS A
6- 379
TODD JAY JR
6- 929
TOLBERT BERT M
6- 854 6-1180
TOLBERT N E
6- 167
TOLSTOI V E
6-1215
TOM SJ
6- 437
TOMASKOVA L
6-1269
TOMLINSON M
6- 135
TOMPKINS MARIANNE
6- 784 6-1384
TONEY S
6-1473
TONGIORGI V COCCONI
6-1812
TORONTO UNIV CANADA
6-1686
TORPEDO EXPERIMENTAL
ESTABLISHMENT GREENOCK
GREAT BRITAIN
6- 959

TOSTESON D C
6-1388
TOTTER J R
6-1134
TOURRET R
6- 195
TOUSCHEK B
6- 456
TOWLER OSCAR A JR
6- 385 6-1029
TOWNE SCIENTIFIC SCHOOL
UNIV OF PENNSYLVANIA
6- 229 6-1658
TREAS H J
6- 774
TREFETHEN LLOYD
MACGREGOR
6-1198
TREFFTZ ELEONORE
6-1271
TREMBLEY JACQUES
6-1827
TREYBAL ROBERT E
6-1693
TRIMMER J D
6-1321
TRUDOVA R G
6- 44
TRUMBORE FORREST A
6-1479
TSIKLIS D S
6- 187
TSYURUPA I G
6- 782
TUCK J L
6- 955
TUCKER CHARLES W JR
6-1183
TULANE UNIV
6-1077 6-1110
TUNG L H
6- 537 6- 800 6- 804
TURKEVICH JOHN
6- 551 6-1166
TURNBULL A H
6- 478
TURNBULL D
6-1239
TURNER C M
6-1586
TURNER R W
6- 601 6-1473
TUROVSKII G YA
6- 177
TYLER SYLVANUS A
6- 784
TYREE S Y JR
6-1396
TYREN HELGE
6-1883

UEBERGANG R
6- 711
UHLIG HERBERT H
6- 588
UMEZAWA H
6- 674 6- 750
UMEZAWA MINORU
6- 740 6-1356 6-1845
UNDERWOOD E E
6- 598 6-1467
UNIVERSITY COLL
LONDON ENGLAND
6-1752
UNIVERSITY OF SOUTHERN
CALIF
6- 87 6- 445
UPHOFF DELTA
6- 57
UPTON A C
6-1071 6-1093
URBANEK JOHANN
6-1168
UREY H C
6-1754 6-1793
UTAH UNIV
6- 498 6- 534 6- 540
6- 567 6- 620

VAINSHTEIN E E
6- 138
VAINSHTEIN F M
6- 177
VALATIN JEAN G
6- 453 6-1939 6-1940
VALLADAS G
6- 634
VALLANDER S V
6- 624
VAN ALLEN JAMES A
6- 928
VAN ALPHEN E
6- 262

NUCLEAR SCIENCE ABSTRACTS

VAN BAALEN J
6- 174
VAN BLITZ C
6-1786
VANDERLAGE F C
6-1192
VAN DER VELDEN H A
6-1294
VANDERWERFF HENRY
6-1112
VAN FAROWE DONALD
6-1096
VANHORN M H
6- 971
VAN LIESHOUT R
6- 420 6- 422
VAN MARLE H
6- 439
VANONI VITO A
6- 184
VAN ORDSTRAND H S
6-1109
VAN ROSSUM L
6-1289
VAN RYSSSELBERGHE PIERRE
6-1450
VAN SCIVER W
6-1A06
VAN SLYKE DONALD D
6-1115 6-1652
VAN UITERT LEGRAND G
6-1631 6-1633 6-1634
VAN VALKENBURG A
6-1429
VAN WIERINGER H
6-1364
VAN WYE R F
6- 211
VASENIN F I
6- 206
VAUTREY L
6- 696
VENDRYES GEORGES
6- 432
VENKATARAMANIAN M
6- 113 6- 823 6-1148
VENKATESWARLU CH
6-1146
VERKHOVSKII B I
6- 260
VERNON L W
6-1409
VERSTER N F
6- 420 6- 422
VIALLARD R
6- A36
VICTOR CHARLES
6- 418
VIDALE M L
6- 267
VIENS G E
6-1251
VIGNERON LEOPOLD
6- 399
VINCENT E T
6- 916
VIOLET CHARLES E
6- 390
VIRGINIA UNIV
MEDICAL SCHOOL
6- 80 6- 790 6- 802
6- A03
VISCONTI ANTOINE
6- 452
VISHNEVSKII V F
6- 263
VITELOZZI WILLIAM J
6- 182
VITRO CORP OF AMERICA
6- A30 6-1184
VODAR BORIS
6- A79
VOIGT A
6- A20
VOIGT ADOLF F
6- 86 6- 539 6-1119
6-1629 6-1553
VOISIN ANDRE G
6-1299 6-1763
VOLDRICH C B
6- 227
VOLK MURRAY E
6- 792
VOLKIN ELLIOT
6-1172
VOLZ H
6- 754
VON SIEMENS WINRICH
6- 996
VOYVODIC J L
6-1761 6-1807
WABER JAMES T
6- 593 6- 805 6-1217
6-1462 6-1731

WABER SANTON
6- 593 6-1217
WACHSMANN F
6-1100
WADE F
6- 956 6- 957
WADSWORTH MILTON E
6-1687
WAFFLER H
6-1020 6-1861
WAGENKNECHT A C
6- 71
WAGGENER W C
6-1625
WAGGONER PAUL E
6- 530
WAGNER C
6-1471
WAGNER CARL
6-1244
WAGNER FRANK JR
6-1048 6-1906
WAGNER WILLIAM C
6-1206
WAHL ARTHUR C
6-1015
WAHL R
6- 632
WALCHER W
6-1793
WALKER D
6- 362
WALL J S
6- 71
WALLACE BRUCE
6- 8
WALLACE P R
6-1536 6-1537
WALLACE W E
6- 235 6-1127 6-1132
6-1472 6-1479 6-1480
WALLENSTEIN MERRILL B
6-1637
WALPOLE R E
6-1692
WALSH P D
6- 556
WALTER JOSEPH L
6-1654
WALTER M
6- 417
WALTON W H
6- A75
WANG C H
6-1179
WANG MING CHEN
6-1902
WANG S J
6- 579
WAPSTRA A H
6- 989 6-1314
WARD J C
6-1055
WARNER J C
6- 597
WARRINGTON P M
6- 75
WARSHAW S D
6- 10
WARSHAWSKY ISIDORE
6-1496 6-1713
WASER P
6- 570
WASSENAAR T
6-1275
WATANABE RONALD
6- 163
WATANABE SATOSI
6-1058
WATERTOWN ARSENAL
6-1341
WATSON H A
6- 126
WATT GEORGE W
6-1125
WATTENBERG A
6-1A29
WATTENBERG ALEXANDER
6- 679
WATTS H
6-1A10
WEAVER BOYD
6- 285
WEAVER H E JR
6- 345 6- 994
WEAVER W E
6- A85
WEBER A H
6- 954
WEBER C E
6- 252 6-1562
WECHSLER M
6-1238
WEEKS ALICE DOWSE
6-1458

WEEKS JOHN R
6- A97
WEIGL J W
6- 75
WEIL JOHN A
6-1395
WEILL J
6-1786
WEILL JACKY
6- 666
WEINBERG A M
6-1190
WEINBERG L
6-1751
WEINBERGER A J
6-1122
WEINHOUSE SIDNEY
6- 760 6- 761 6- 792
6- 794
WEINSTEIN ROY
6-1312
WEINTRAUB MURRAY
6-1719
WEISER JEANNE D
6-1452
WEISS HERBERT G
6-1797
WEISS JEROME
6- 103
WEISS R J
6-1341
WEISSKOPF V F
6-1522
WELKER JOAN P
6-1123
WELLCOME RESEARCH LABS
6-1112
WELLER JOHN M
6- 791 6- 793
WELLS F H
6- 943
WENNER CHARLES E
6- 760 6- 761
WERNER L B
6- 468
WESTERN RESERVE UNIV
6- A68
WESTERN RESERVE UNIV
SCHOOL OF MEDICINE
6- 33 6- 50 6- 546
6-1378
WESTINGHOUSE ATOMIC
POWER DIV
6- A93
WESTINGHOUSE RESEARCH
LABS
6-1484
WESTPHAL K
6-1A91
WETHERILL GEORGE
6- 972
WEXLER AARON
6-1739
WEXLER SOL
6-1420
WEYGAND FRIEDRICH
6- 569 6- 853
WEYL W A
6- 116 6- 117 6- 118
6- 119
WHALING W
6-1A59
WHEELER H L JR
6-1196 6-1234
WHEELON O A
6- 906
WHITCHER STANLEY L
6-1343
WHITE ALBERT EASTON
6-1207
WHITE D F
6-1088
WHITE M G
6-1A87
WHITE MARCIA R
6-1615 6-1516
WHITE R STEPHEN
6- 324 6- 571
WHITE SIDNEY
6- 19
WHITE WILLIAM C
6-1421
WHITEHEAD MARIAN
6- 669
WHITEHOUSE W J
6-1A51
WHITMORE F C
6- 130
WICK GIAN CARLO
6-1544
WIDGOFF M
6-1A12
WIED GEORG L
6- 52

AUTHOR INDEX

WIESNER J B
 6-1750
 WIGNER E
 6-1A39
 WIJSMAN R A
 6-777
 WILBUR KARL M
 6-1590
 WILCOX HOWARD A
 6-297
 WILD ROBERT LEE
 6-400
 WILDE W S
 6-1077
 WILDER C D
 6-1369
 WILETS L
 6-1930
 WILEY RICHARD H
 6-A51
 WILHELM H A
 6-276
 WILKINS C J
 6-133
 WILKINS J ERNEST JR
 6-384 6-1285
 WILKINS J J
 6-699 6-700
 WILKINSON D H
 6-1861
 WILKINSON G
 6-1A57
 WILKINSON K L
 6-639
 WILKINSON R 3
 6-1352
 WILLARD H B
 6-1535
 WILLARD JOHN E
 6-1659
 WILLIAMS ARTHUR H
 6-430
 WILLIAMS DALE D
 6-1237
 WILLIAMS I
 6-1600
 WILLIAMS J H
 6-1503 6-1887
 WILLIAMS ROGER D
 6-1103
 WILLIAMS W S C
 6-370
 WILLIAMSON G K
 6-605 6-606
 WILLMORE TRACY A
 6-1216
 WILSON A H
 6-1772
 WILSON C W
 6-392
 WILSON E BRIGHT JR
 6-1417
 WILSON ELIZABETH
 6-734
 WILSON H A
 6-992
 WILSON H B
 6-1069
 WILSON H W
 6-1559
 WILSON J G
 6-1A24
 WILSON RICHARD
 6-337
 WILZBACH K E
 6-1176
 WINKLER H
 6-1A84
 WINSOR FREDERICK J
 6-A88
 WINZLER RICHARD J
 6-72
 WISCHUSEN E
 6-272
 WISCONSIN UNIV
 6-79 6-335 6-535
 6-985 6-986 6-987
 6-1636 6-1650 6-1878
 WISCONSIN UNIV
 COLL OF AGRICULTURE
 6-71
 WISE E M
 6-A05
 WISER WENDELL H
 6-1426
 WITZIG WARREN F
 6-A93
 WOLFE R A
 6-916
 WOLFENDALE A W
 6-257
 WOLFF P
 6-918
 WOLFF PETER A
 6-389
 WOLKERS G J
 6-1275
 WOLLAN E O
 6-1038 6-1948
 WOLTERINK LESTER F
 6-529
 WOMELDORF RAYMOND C
 6-1216
 WONG J B
 6-1708
 WOOD BETTY
 6-1090
 WOOD GEORGE P
 6-A65
 WOODBURY ERIC JOHN
 6-1A75
 WOODRUFF E P
 6-1489
 WOODS M C
 6-25
 WOOLARD LOUIS E
 6-1224
 WORNER H W
 6-1247 6-1691
 WORTHINGTON WILLIAM
 JACOB JR
 6-1A64
 WOUTERS LOUIS F
 6-386 6-483 6-715
 WRIGHT J
 6-135
 WRIGHT J M
 6-558 6-563
 WRIGHT W B
 6-1123
 WU C S
 6-1909
 WYANT DONALD G
 6-1456
 WYANT ROBERT A
 6-A88
 WYMAN L L
 6-1780
 YAFFE RUTH POWERS
 6-539 6-1119 6-1629
 6-1653
 YALE UNIV
 6-1114
 YALOW ROSALYN
 6-68
 YAMAGUCHI YOSHIO
 6-740
 YANG C N
 6-328 6-725
 YANKLEY ALEXANDER
 6-19
 YEAMAN M D
 6-A14
 YEARIAN H J
 6-A76
 YEKUTIELI G
 6-259 6-308 6-1826
 YESHIVA UNIV
 6-1714
 YIH C S
 6-979
 YOCHER CATHERINE
 6-1288
 YOLLES S
 6-1396
 YOST DON M
 6-554
 YOUNG F W JR
 6-1349
 YOUNG G T
 6-A19
 YOUNG L
 6-1227
 YOUNIS S
 6-1020
 YUAN LUKE C L
 6-1525
 YUSTER PHILIP
 6-1427
 ZABEL C W
 6-980
 ZACKAY VICTOR F
 6-202
 ZAFFARANO D J
 6-735
 ZAJAC BARBARA
 6-1921
 ZARZYCKI GEORGES
 6-541
 ZEBROSKI E L
 6-1130
 ZELDES H
 6-435 6-436
 ZEMANSKY M W
 6-1260
 ZHUKOVSKII N N
 6-421
 ZIEGLER W T
 6-147
 ZILL L P
 6-101 6-148
 ZIMMERMAN C
 6-1567
 ZIMMERMAN WILLIAM III
 6-89
 ZINN W H
 6-477 6-1583
 ZIRINSKY S
 6-600 6-1238
 ZUNTI W
 6-1007 6-1017 6-1023
 ZWOLINSKI BRUNO J
 6-620 6-1637
 ZYRYANOVA L N
 6-433

SUBJECT INDEX

The underscored number followed by a colon is the volume number, and the numbers following are the abstract numbers. The designation (R) following an abstract number indicates that it is the abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

Absorption spectra

(See also subheading spectra under materials and radiation; also heading identified by name of radiation, e.g., Neutron spectra.)
of anions, effect of complex formation on, 6: 1428
interpretation and theory of, 6: 1302(R)

Accelerators

(See also specific accelerators.)
performance of factors affecting, 6: 1393(R)

Acetates

metabolism of, by Propionibacterium pentosaceum, 6: 1697

Acetic acid

ionization of, in dioxane-water solutions, 6: 1631
isotopic exchange reactions in, 6: 1626

Acetic acid (labeled)

synthesis of methyl-labeled, 6: 1699

Acetic acid, bromo-

polarographic behavior of, 6: 538

Acetic acid, bromo-, ethyl ester

polarographic behavior of, 6: 1639, 1640

Acetic acid, chloro-

polarographic behavior of, 6: 807

Acetic acid, chloro-, ethyl ester

polarographic behavior of, 6: 807

Acetic acid, (Ethylenediamine)tetra-

toxicology of, and effect of, on excretion of Pu, 6: 496(R)

Acetic acid, trifluoro-

molecular dipole moments of, 6: 131(J)

Acetic acid, vinyl ester (labeled)

synthesis of, 6: 174(J)

Acetic anhydride

isotopic exchange reactions in, 6: 1626

Acetone

catalytic reduction of, 6: 551

Acetone, thenoyltrifluoro- complexes

of Th in aqueous solution, ionization of, 6: 1625

Acetophenone

acylation of, with acetic anhydride, 6: 91(R)

electric conductivity of solutions of cobalt(II) nitrate in, 6: 84

Acetyl chloride

isotopic exchange reactions of, in acetic anhydride, 6: 1626

Acetylene

molecular vibration of, and of its deuterated forms, 6: 137(J)

Acetylene, diphenyl-

scintillations in, 6: 961

Acids

(See also specific compounds; also general and specific headings for acids, e.g., Amino acids; Fatty acids; Nucleic acids.)
corrosive effects on Ni, Ni alloys, and stainless steel, 6: 1217

Actinium isotopes Ac^{228}

beta spectra of, 6: 1557(J)

Actinium isotopes Ac^{229}

half lives of, 6: 284

Actinium isotopes Ac^{230}

formation and decay schemes of, 6: 284

Adenosine phosphoric acids

fluorimetric analysis of, 6: 1134

Adenylic acid

exchange of P of, with inorganic phosphate, 6: 802

Adenylpyrophosphoric acid

exchange of P of, with inorganic phosphate, 6: 802

Adrenal glands

effects of adrenaline on, 6: 1075

effects on survival of rats after x irradiation, 6: 507

Adrenaline

effects on adrenal and thyroid glands, 6: 1075

Adrenocorticotrophic hormone

effects on fecal lysozyme titer, 6: 9

effects on gastric secretions, 6: 7

in treatment of radiation sickness, 6: 58(J)

Adsorption

(See also subheading under materials adsorbed; also subheading adsorptive properties under adsorbents.)

of dissolved substances on liquid surfaces, measurement of, 6: 176(J)

Aerodynamics

performance of bare-wire thermocouples in air streams, 6: 1713

Aerosols

(See also Particles, Powders, and Smokes.)

collection of, by atomized sprays, 6: 1439

dispersal of, in lower atmospheric layers, 6: 676(R)

filtration of, inertial mechanism in, 6: 517(J)

flocculation of, by intense high-frequency sound, 6: 862

impaction of, on surface and body collectors, 6: 1708

polydispersity and nucleation in, 6: 609(R)

sampling and analysis of, equipment for, 6: 657(R)

Air

(See also Gases and Meteorology.)

analysis of, electronic method for, 6: 576(J)

excitation potentials of, 6: 396(J)

fission products in, maximum allowable concentrations of, 6: 1611

ionization in, from β ray point sources, 6: 763

ranges of protons in, 6: 1345(J)

Air flow

(See also Fluid flow and Gas flow.)

convection at high velocities and temperatures, measurement of, 6: 1717(J)

heat-transfer coefficients and friction factors for, in an inconel tube, 6: 866

in large rooms, scale-model studies of, 6: 873(J)

performance of bare-wire thermocouples in, 6: 1713

turbulence in, characteristics of, 6: 677(R)

Aircraft engines

(Covering chiefly equipment and theory of engines not dependent on nuclear energy: see also Turbojet engines.)

design of nuclear turbojet, 6: 1589

heat exchangers for, 6: 865

Albumins

exchange of, between blood and lymph, 6: 25

Aldol (labeled)

synthesis of, 6: 174(J)

Aldonic acid

in synthesis of glyconyl peptide, 6: 162

Algae

carbon dioxide metabolism in, pH effects on, 6: 531

pigments in blue-green, 6: 14

Alkali halide crystals

fluorescence of, α - or γ -induced, 6: 653(R)

fluorescence, phosphorescence, energy storage, and release of stored energy by light in, 6: 1749(R)

Alkali halides

phase studies of, 6: 96(J)

Alkali metal compounds

heat of reaction of, 6: 94(J)

Alkali metals

(See also specific element concerned.)

analysis of mixtures of, and alkaline earths, 6: 825(J)

Alkaline earth metals

analysis of mixtures of, and alkali metals, 6: 825(J)

Alkaline earth sulfides

fluorescence of, α - or γ -induced, 6: 653(R)

Alkanes

absorption of photons of cosmic radiation in, 6: 258(J)

Alkyl iodides

influence of structure phase and added I_2 on the organic yields of the I^{127} (n, γ) I^{128} reaction in, 6: 1659

Alloys

(See also Steel, Stainless steel, and alloys of individual metals, e.g., Aluminum alloys.)

bibliographies on light, 6: 904

equation of diffusion in binary, solutions of, 6: 1244(J)

Alpha decay

correlation of rates of, 6: 363

in the medium heavy elements, rates of, 6: 410

of nuclides with atomic numbers less than 83, rates of, 6: 1556

Alpha particles

angular correlations of, from photodisintegration of C^{12} , 6: 1861

chemical effects on hydrocarbons, 6: 1421(J)

chemical effects on water, 6: 143(J), 144(J)

detection and measurement of, 6: 474(P)

dosage determinations of, in single biological cells, 6: 293

effects on alkaline phosphatase activity, 6: 28

effects on liquids, 6: 556

effects on semiconductors, 6: 557(J)

electron-hole production in Ge by, 6: 1044(J)

emitters of, resulting from α -particle bombardment of Pb, 6: 411

from fission of U^{235} , and Pu^{239} , energy distribution of, 6: 698

genetic effects on fungi, 6: 1085

lethal dosage of, compared with x radiation, 6: 1607(J)

from $Li^6(d,\alpha)$, angular distribution of, 6: 710(J)

from $Li^6(p,\alpha)$, angular distribution of, 6: 711(J)

measurement of, proportional detectors for, 6: 959

measurement of tracks of, in nuclear emulsions, 6: 644

mitotic effects on roots, 6: 39(J)

monitoring of, instrument for, 6: 1805(J)

oxidation of arsenite in aqueous solution by, 6: 837(J)

oxidation and reduction produced by, 6: 146(J)

from photodisintegration of C^{12} , energy distribution of, 6: 704(J)

production of abnormal spore germination and microthallus in fungi by 6: 1073

from proton bombardment of Be^9 , 6: 405

from rare-earth nuclei, 6: 412

response of scintillation crystals to, 6: 966(J)

scattering of, in He, 6: 1033(J)

Alpha sources

calibration of, apparatus for, 6: 474(P)

Aluminum

absorption of cosmic electrons in, 6: 262(J)

absorption of cosmic photons in, 6: 258(J)

analysis of, by pile activation, 6: 549(J)

annealing textures in rolled, 6: 1242(J)

bibliographies on production, fabrication and uses of, 6: 904

cathodic sputtering of, 6: 252

colorimetric analysis of, for B, 6: 1140(J)

corrosion of, by H_2O_2 , 6: 240(J)

dynamic coefficients of, 6: 245(J)

electric conductivity of, effect of elastic deformation on, 6: 241(J)

electron scattering by, 6: 1035(J)

excitation potentials of, 6: 396(J)

extinction in, 6: 605(J)

gamma reactions (γ,n) at 320 and 160 Mev, 6: 1538

heat of combustion of, 6: 1131(J)

helium diffusion through, 6: 1745

infrared spectra of, calculations, 6: 161(J)

intensities in diffraction pattern of, effect of cold work on, 6: 606(J)

lower oxidation states of, 6: 1125(J)

π^- -meson scattering cross sections of, 6: 319

π^- -mesons from, by photon reactions, 6: 317

neutron cross sections of, 6: 1526

photometric determination of, in Zn and steel, 6: 1139(J)

plastic flow in, 6: 603(R)

ranges of protons in, 6: 1345(J), 1901(J)

recrystallization texture of, in drawn wire, 6: 1743(J)

rolling textures in, 6: 1245(J)

scattering of neutrons by, 6: 980

slip bands and hardening in, during plastic deformation, 6: 1258(J)

slip formation in polycrystalline, 6: 899

stress corrosion of, 6: 1219(J), 1624

Aluminum alloys

bibliographies on, 6: 904

corrosion of surface treated, 6: 1735

creep and tensile properties of dilute α solid solutions of, 6: 1235

Aluminum alloys (cont'd.)

fatigue strength of, effect of shape of cross section on, 6: 193(J)

grain refinement of cast, by addition of Ti and B, 6: 1253(J)

grain refinement of, mechanism of, 6: 907(J)

metallurgical properties of, for high temperature use, 6: 596

plastic properties of, effect of alloying elements on, 6: 231(R)

polarographic analysis of, for Cr, 6: 1407(J)

welding of, by argon arc process, 6: 859(R)

Aluminum alloys (alclad)

mechanical and corrosion tests of spot-welded, in tidewater and weather, 6: 888

Aluminum-chromium compounds (intermetallic)

x-ray-diffraction analysis of, 6: 199

Aluminum complexes

equilibrium constants of, 6: 535

Aluminum-copper alloys

aging of, x-ray-diffraction analysis of, 6: 244(J)

Aluminum-copper compounds (intermetallic)

crystal structure of, 6: 827(J)

Aluminum-copper-magnesium alloys

aging of, x-ray-diffraction study of, 6: 244(J)

constitution diagrams of, 6: 243(J)

Aluminum-copper single crystals

tensile properties of, 6: 603(R)

Aluminum crystals

plastic deformation in, x-ray and micrographic study of, 6: 1255(J)

Aluminum iodides

preparation of, 6: 1133(J)

Aluminum isotopes

mass defect of, 6: 1553

Aluminum isotopes Al^{24}

formation and nuclear properties of, 6: 1006

formation, mass, and decay of, 6: 737

Aluminum isotopes Al^{26}

energy levels of, 6: 986

Aluminum isotopes Al^{27}

alpha reactions (α,p) coincidences of protons and gammas, 6: 1878(J)

binding energy of, calculation, 6: 333(J)

deuteron reactions (d,d') and (d,p), 6: 1008(J)

energy levels of, 6: 1008(J)

gamma reactions (γ,n), 6: 1876(J)

mass of, 6: 1530

nuclear magnetic moments of, 6: 995(J)

proton bombardment of, γ rays from 6: 440(J)

proton reactions (p,n), excitation functions for, 6: 1021(J)

Aluminum isotopes Al^{28}

beta and γ emission and mass of, 6: 1530

energy levels of, 6: 1008(J)

Aluminum-magnesium alloys

corrosion of, mechanism of, 6: 248(J)

reaction of, with steam, 6: 1257(J)

stress-corrosion mechanism in, 6: 1219(J)

stretcher-strain markings in, 6: 1252(J)

Aluminum-magnesium-silicon alloys

grain refinement of, effect of various additions on, 6: 250(J)

Aluminum-magnesium-zinc alloys

corrosion of, mechanism of, 6: 248(J)

Aluminum-molybdenum compounds (intermetallic)

x-ray-diffraction analysis of, 6: 199

Aluminum-nickel alloys

crystal structure of, in β phase, 6: 242(J)

Aluminum-nickel compounds (intermetallic)

x-ray-diffraction analysis of, 6: 199

Aluminum oxide films

preparation and electrical properties of, 6: 1391

Aluminum oxides

analysis, fabrication, preparation, and properties of, compilation of, data on, 6: 1447

ceramic containing, 6: 886(P)

thermal conductivity of, 6: 204, 1448(R)

Aluminum-silicon alloys

grain refinement of, effect of various additions on, 6: 250(J)

Aluminum-silver alloys

fatigue mechanism in, 6: 1248(J)

Aluminum single crystals

delay time for the initiation of slip in, 6: 1742(J)

plastic deformation of, 6: 247(J), 618(R), 1470(R)

plastic deformation in, x-ray microscopy method of studying, 6: 1250(J)

x-ray asterisms from deformed, 6: 1254(J)

Aluminum-thorium alloys

metallography of, with polarized light, 6: 1228

- Aluminum-titanium alloys
constitution diagram and microstructure of, 6: 908(J)
crystal structure of, from x-ray diffraction data, 6: 1243(J)
preparation of, from TiO_2 and Al powder, 6: 607(J)
- Aluminum-uranium alloys
metallography of, with polarized light, 6: 1228
- Aluminum-zirconium alloys
constitution diagrams of, 6: 591(R)
- Americium
bone deposition of, 6: 1389
chemical separation of, 6: 468(P)
radiometric determination of, 6: 105
separation of from Pu and U, 6: 105
- Americium fluorides
vapor pressure and heat of sublimation of, 6: 123
- Americium isotopes Am^{241}
alpha emission, measurement of, 6: 1481
alpha spectra of, 6: 415
decay schemes of, 6: 413
slow neutron reactions of, 6: 357
- Americium isotopes Am^{242}
formation and slow neutron fission of, 6: 357
- Americium isotopes Am^{243}
formation and slow neutron fission of, 6: 357
- Amherst Coll.
progress reports, 6: 1425(R)
- Amino acids
biosynthesis of, by *ustilago zeae*, 6: 759
chromatographic determination of, in normal and x irradiation egg yolks, 6: 508
isotopic equilibration analysis of, for glutamic acid, 6: 819(J)
in synthesis of glyconyl peptides, 6: 162
uptake of glucose C^{14} by, in mouse brain, 6: 72(J)
- Ammonia
biosynthesis of, by bacteria, 6: 71
compressibility isotherms and thermodynamic functions of mixtures of, with H_2 and N_2 , 6: 1275(J)
synthesis of, in γ -ray field, 6: 1431
- Ammonia (liquid)
thermodynamic functions of ammoniacal species in, 6: 809
- Ammonium chlorides
atomization of, 6: 1439
- Ammonium fluoerrates
infrared spectrum of, 6: 1667(J)
- Ammonium fluorides
fluorination of chlorides with, 6: 133(J)
- Ammonium sulfites
atomization of, 6: 1439
- Ammonium vanadium sulfates
absorption spectra of, 6: 1647(J)
- Amplifiers
(See also electron tubes.)
design of, 6: 407(R), 635(J)
operating manual for linear type AEP 1444 (Canada), 6: 1495
overloading characteristics of type 1444 (Canada), 6: 1802(R)
pulse type, performance data for, 6: 1278(R)
- Anemia
induced by diversion of erythrocytes into the lymph by x rays, 6: 1599
induced by Ra, 6: 787
pathogenesis of postirradiation, 6: 1598
sodium and K levels of erythrocytes in sickle cell, 6: 1388
- Animal care
(Caging, sanitation, ventilation, feed, disease control, etc.; see also subheading care under specific animals.)
criteria for design and air conditioning of rodent quarters, 6: 1373
- Animal cells
alpha dosimetry in single, with scintillation counters, 6: 293
division of, changes in mitotic spindle during, 6: 5
effects of malignancy on, 6: 65(J)
effects of x radiation and colchicine on, 6: 36
effects of radiation on, 6: 771(J)
effects of radiation on, chemical modification of, 6: 49
effects of x radiation on respiration in, 6: 763, 1079, 1084
metabolism of, studies in tissue culture, 6: 797(J)
- Anion exchanging compounds
adsorptive properties of, theory, 6: 1687
- Anions
absorption spectra of, effect of complex formation on, 6: 1428
- Anoxia
effects on radiation damage in mice, 6: 45
protection against radiation damage in mouse embryos by, 6: 1078
- Anthers
phosphatase activity of, 6: 3
- Anthracene
purification of, 6: 533
specific fluorescence of, exciton theory of, 6: 306(J)
- Anthracene crystals
preparation and properties of, 6: 533
response of, to charged particles, 6: 966(J)
scintillation efficiency of, effect of pressure on, 6: 826
- Anthracene, diphenyl-
scintillations in, 6: 961
- Anthranilic acid
in maize, as an agent causing blue fluorescence, 6: 774(J)
- Antibiotics
(See also specific antibiotics.)
in therapy of radiation sickness, 6: 784
in therapy of radioinduced bacteremia, 6: 1384
- Antibodies
formation of, effects of radiation on, 6: 1595
formation of, effects of x rays on, 6: 1375
localization of, prepared from rat aorta, 6: 1113
preparation of, from rat aorta, 6: 1113
- Antimony
gamma absorption cross sections of, 6: 1326
gamma cross sections of, 6: 364
- Antimony isotopes Sb^{121}
gamma reactions (γ, n), 6: 1871(J)
- Antimony isotopes Sb^{122}
beta spectra of, 6: 1304(R)
isomeric transition of, 6: 409
- Antimony isotopes Sb^{123}
gamma reactions (γ, n), 6: 1871(J)
- Antimony isotopes Sb^{124}
beta-gamma angular correlation in, 6: 1913(J)
forbidden β spectra of, 6: 1914(J)
- Antimony isotopes Sb^{125}
yield and half lives of, from U^{233} and U^{235} fission, 6: 1857
- Apatites
analysis of, for calcite, 6: 1452
- Archeological specimens
age estimations of, by radiocarbon analysis, 6: 755(J)
- Argentina (Chubut Province)
geology of, 6: 215(J)
- Arginine
biosynthesis of, by yeasts, 6: 794
- Argon
adsorption of, on C, 6: 1425(R)
collision probability for slow electrons in, 6: 1490
ionization of, by electrons, 6: 1263(J)
multiple scattering of β^+ particles in, 6: 1899(J)
neutron scattering cross sections of, 6: 679
scattering of electrons and positrons in, 6: 401(J)
thermodynamic properties of adsorbed, on titanium dioxide, 6: 154(J)
- Argon isotopes A^{36}
mass of, 6: 991(J)
- Argon isotopes A^{37}
nuclear recoils from decay of, 6: 1909
- Argon isotopes A^{38}
mass of, 6: 991(J)
- Argon isotopes A^{39}
half lives of, 6: 1924(J)
- Argon isotopes A^{40}
deuteron reactions (d,p), 6: 1870(J)
photoprotons from, energy distribution of, 6: 1861
- Argon isotopes A^{41}
formation of, by the reaction A^{40} (d,p), 6: 1870(J)
properties of energy states of, 6: 1859
- Argonne graphite reactor
reactivity of, measurement, 6: 1527
- Argonne National Lab.
progress reports, 6: 1506(R)
progress reports on biological and medical research, 6: 500(R)
- Armour Research Foundation
progress reports, 6: 604(R)
progress reports on Zr-base alloys, 6: 591(R)
- Arsenic isotopes As^{75}
magnetic resonances and nuclear magnetic moments of, 6: 345(J)
nuclear magnetic moments of, 6: 1850(J)
- Arsenic isotopes As^{76}
gamma emission of, 6: 741(J)
tissue distribution of, 6: 1614(J)
in treatment of Hodgkin's disease and fungoid mycosis, 6: 1614(J)

- Arsenite ion
 - oxidation of, by α and x rays in aqueous solution, 6: 837(J)
- Ascorbic acid
 - inactivation of enzymes by, 6: 1590
 - oxidation of, effect of thyroxine and derivatives on, 6: 80, 803
 - radiosensitivity effects of, 6: 520(R)
- Astatine
 - uptake of, by thyroid gland, 6: 496(R)
- Astrophysics
 - isotopic abundances in universe, 6: 1754
 - transition probabilities for C_2 and H_2^+ , 6: 256
- Atherosclerosis
 - chemical prophylaxis of, by heparin, 6: 19(J)
 - pathology and chemical prophylaxis of, 6: 496(R)
- Atmosphere
 - balance of ions in, 6: 439(J)
 - diffusion in, from a point source, 6: 979
 - radioactivity in, concentration of, 6: 429(J)
 - temperature fluctuations of, under different meteorological conditions, 6: 1520(R)
 - turbulence and diffusion of particulate matter in, 6: 676(R), 1516(R), 1517(R), 1519(R)
 - turbulence in, characteristics of, 6: 677(R)
 - turbulence of, and particle distribution in, measurement of, 6: 1518(R)
 - velocities in, frequency distributions of, 6: 331(J)
- Atomic beams
 - focusing by magnetic field, theory and apparatus for, 6: 1335(J)
- Atomic bomb explosions
 - (See also Radiological warfare.)
 - azimuth and elevation determination of, 6: 1572(P)
 - effects of radiations from, on seed, 6: 32
 - fall-out from, 6: 1(R)
 - lethal effects of, 6: 1587(J), 1588(J)
 - relation of atmospheric radioactivity to, 6: 429(J)
- Atomic energy
 - chemical aspects of, lectures on, 6: 833(J)
- Atomic Energy Commission
 - administrative reports, 6: 491
 - organization and function of, 6: 1069(J)
 - reactor program of, lecture on, 6: 1318
 - research programs in physics, 6: 1487
- Atomic Energy Project (Canada)
 - progress reports, 6: 1802(R)
- Atomic Energy Project, Univ. of Rochester
 - progress reports, 6: 509(R)
- Atomic Energy Project, Western Reserve Univ.
 - progress reports, 6: 1379(R)
- Atomic Energy Reserch Establishment (Great Britain)
 - atomic central heating plant at, 6: 1068(J)
 - safety handbooks used at, 6: 514
- Atomic structure
 - (See also as subheading under specific elements.)
 - wave functions for the p shell, 6: 1364(J)
- Aureomycin
 - radiosensitivity effects of, on dogs, 6: 516(R)
- Aurintricarboxylic acid
 - in treatment of Be poisoning, 6: 1615, 1616
- Azides
 - radiosensitivity effects of, 6: 51(J)
- Bacteremia
 - antibiotic therapy of radioinduced, 6: 1384
- Bacteria
 - (See also by species.)
 - effects of P^{32} β particles on viability of, 6: 1603(J)
 - effects of radiation on, chemical modification of, 6: 47
 - effects of radiation on genetic changes in, 6: 1086
 - effects of x radiation on, bibliography on, 6: 1377
 - fermentation of glucose by, 6: 165
 - formation of formic hydrogenylase by, effects of x-radiation on, 6: 29
 - metabolism of, as affecting oxidation of sewage, 6: 1597
 - metabolism of, studied by ethanol synthesis in *Pseudomonas lindneri*, 6: 1619(J)
 - metabolism of, studied in *Lactobacillus casei* purine anabolism, 6: 1112
 - metabolism of, studied in an oxidative cycle in the propionic acid bacteria, 6: 1697
 - nitrogen fixation by, 6: 71
 - ribonucleic acids determination in, 6: 762
- Bacterial slimes
 - adsorption and assimilation of P^{32} by, 6: 789(R)
- Barium
 - spectrographic determination of, in organic solids, 6: 158
 - uptake and distribution of, in *Drosophila*, 6: 503, 1595
- Barium carbonates
 - neutron diffraction analysis of, 6: 1548
- Barium chlorides
 - ionization of, 6: 541(J)
- Barium complexes
 - dissociation of, in aqueous solutions, 6: 564(J)
- Barium compounds
 - chelation of, with β -diketones, 6: 1634
- Barium isotopes Ba^{133}
 - isomeric magnetic dipole transitions in, 6: 335
- Barium isotopes Ba^{134}
 - gamma cascades in, following β decay of Cs^{134} , 6: 689(J)
 - nuclear spin of, 6: 689(J)
- Barium isotopes Ba^{137}
 - internal conversion in, 6: 1919(J)
- Barium isotopes Ba^{138}
 - gamma and x-ray emission of, accompanying La^{138} decay, 6: 1916(J)
- Barium isotopes Ba^{140}
 - preparation of carrier-free, 6: 1422
 - yield of, from proton-induced fission of U, 6: 1856
- Barium titanate single crystals
 - dielectric properties of, 6: 207(J)
- Battelle Memorial Inst.
 - progress reports, 6: 1736(R)
- Bearings
 - corrosion of, and corrosion inhibitors for, 6: 1218
 - design and lubrication of, 6: 182
- Benemid
 - radiosensitivity effects on chickens, 6: 520(R)
- Benzanthrane
 - chemical properties of, changes in after irradiation, 6: 1170(J)
- Benzanthrane (labeled)
 - synthesis and structure determination of, 6: 175(J)
- Benzene
 - chemical effects of α particles on, 6: 1421(J)
 - fluorescence of, α - or γ -induced, 6: 653(R)
 - molecular vibrations of, and of its deuterated forms, 6: 137(J)
 - solubility of metallic nitrate hydrates in, 6: 83
- Benzene (labeled)
 - effects of radiation on benzene- d_6 , 6: 1676
- Benzene (1,2-epoxyethyl)-
 - reaction mechanisms of, 6: 1390
- Benzenephosphonic acid, p-ethyl-, dimethyl ester
 - synthesis of, 6: 851
- Benzimidazoles, 1-glycosyl-
 - synthesis of, 6: 1178(J)
- Benzoic acid
 - polarographic behavior of, 6: 806
 - as reagent in determination of Zr, 6: 113(J)
- Benzoic acid, p-benzenesulfonyloxy-
 - preparation of, 6: 93
- Benzoic acid, p-chloro-, mercury salt
 - effects on mice, 6: 763
- Benzoic acid, iodo-
 - polarographic behavior of, 6: 806
- Benzoxazole, 2-(o-hydroxyphenyl)-
 - as reagent for gravimetric determination of Cd, 6: 1654
- Beryllium
 - alpha reactions (α, n), 6: 1537
 - cathodic sputtering of, 6: 252
 - chemical and spectrographic analysis of, 6: 1657
 - deuteron reactions (d, p) and (d, n), 6: 1892(J)
 - electron scattering by, 6: 1036(J)
 - extrusion, forging, welding, and tensile properties of, 6: 224
 - fluorimetric determination of traces of, 6: 543
 - gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538
 - π^0 -mesons from, by photon reactions, 6: 317
 - metallurgy of, with polarized light, 6: 1228
 - neutron cross sections of, 6: 1526
 - neutron scattering cross sections of, 6: 493(J)
 - neutron total cross sections for, 6: 1017(J), 1023(J)
 - penetrating showers produced in, by cosmic radiation, 6: 265(J)
 - proton reactions (p, n), 6: 1535, 1887
 - as a reactor moderator, 6: 1315
 - toxicology of, review of research on, 6: 1109(J)
- Beryllium complexes
 - equilibrium constants of, 6: 535

Beryllium isotopes

energy levels of, α -particle models for, 6: 691(J)

Beryllium isotopes Be⁷

formation of, by proton bombardment of C¹², 6: 376(J)

neutron reactions (n,p), 6: 1859

nuclear recoils from decay of, 6: 1909

recoil momenta in decay of, 6: 349(J)

in uranium fission products, search for, 6: 358

Beryllium isotopes Be⁸

alpha spectra of, 6: 493(J)

calibration of nuclear emulsions using electron-positron pairs from, 6: 1807(J)

energy levels of, 6: 699, 709(J), 1880(J)

Beryllium isotopes Be⁹

alpha reactions (α ,p), (α ,d), and (α , α'), 6: 1010(J)

deuteron reactions, 6: 1880(J)

deuteron reactions (d,t), 6: 375(J), 1859

gamma reactions (γ ,n), yield and energy of neutrons from, 6: 1829

π^- -mesons from, by proton reactions, 6: 670

proton reactions (p, α), 6: 405, 1016(J)

proton reactions (p,d), 6: 1016(J), 1334(J)

proton reactions (p, γ), 6: 405

proton reactions (p,n), 6: 1859

Beryllium isotopes Be¹⁰

nuclear spin and energy levels of, formed by the Be(d,p) reaction, 6: 1892(J)

Beryllium oxide powders

crystal structure of, 6: 1726(J)

Beryllium poisoning

(See also Beryllium—toxicology.)

chemotherapy of, with aurintricarboxylic acid, 6: 1615

chemotherapy of, with various dyestuffs, 6: 526(R)

control of, review of industrial hygiene methods for, 6: 788(J)

therapy of, with aurintricarboxylic acid, 6: 1616

Beryllium single crystals

mechanical properties and plastic deformation of, 6: 229(R)

Beryllium-thorium compounds (intermetallic)

x-ray-diffraction analysis and crystal structure of, 6: 1729

Beryllium-uranium compounds (intermetallic)

neutron and x-ray-diffraction analysis and crystal structure of, 6: 1729

Beta decay

(See also subheading beta emission under elements and isotopes.)

angular correlation of radiation accompanying, theory, 6: 688(J)

matrix elements of, 6: 431(J), 738(J)

tables of data on, 6: 433(J)

theorem involving binding energies in relation to, 6: 1558(J)

theory of, 6: 408, 740(J), 1909

theory of, of Bi²¹⁰ and Tm¹⁷⁰, 6: 1356(J)

theory of, interaction in, 6: 366(J), 1941(J)

theory of, monographs, 6: 1554

Beta particles

(From nuclear processes; including negatrons, etc.; see also subheading beta reactions under specific elements and isotopes. See also Electrons and Positrons.)

absorption curves for theoretical, 6: 732(R)

biological effects on viability of *E. coli*, 6: 1603(J)

blackening of photographic plates by, 6: 1287

detection and measurement of, 6: 650(R), 960(R)

determination of relative intensity of positive and negative, 6: 475(P)

dosage determination of, with photoemulsions, 6: 964(J)

effects on biochemical oxidation of domestic sewage, 6: 1597

effects on liquids, 6: 556

energy changes of, in a cloud chamber, 6: 723(J)

multiple scattering of + and -, in A, 6: 1899(J)

portable instruments for measuring, 6: 313(J)

proportional counter for soft, 6: 309(J)

scattering of, following passage through matter, 6: 1348(J)

scattering of, in air, 6: 1628

self-scattering and self-absorption of, in NaCl, Pb(NO₃)₂ and Ti(NO₃)₃, 6: 1344

Beta spectra

(See also subheading beta emission under specific elements and isotopes.)

determination of, by nuclear emulsions, 6: 1560(J)

Fermi distribution for, recoil corrections to, 6: 1920(J)

influence of coulomb field on, tables, 6: 433(J)

Beta spectrometers

correction of magnetic lenses used in, 6: 281(J)

design of, 6: 444(R)

design and performance of, 6: 422(J), 954(R)

design of, at Zeeman Lab., Amsterdam, 6: 1371

Beta spectrometers (cont'd.)

operation of semicircular type, 6: 995(J)

in study of γ -rays associated with selected neutron-induced radioactivities, 6: 1907

Betatrons

instrumentation for, 6: 680(R)

monitor and x-ray yield integrator for, 6: 1799

spectra of, experimental determination of, 6: 1808(J)

technique for producing γ -n and γ -p activities with, 6: 279(J)

Bevatron

design of, 6: 1481

Bibliographies

(See also as subheading under specific subjects.)

on analysis for CO₂, H₂, and O₂, 6: 110

Biological systems

isotopic effects of C¹⁴ on, 6: 1387

Biophysics

influences of quantum theory on, 6: 18(J)

Biphenyl

scintillations in, 6: 961

Bismuth

electrolytic separation and determination of, 6: 1138(J)

metallography of, with polarized light, 6: 1228

photofission of, 6: 1860

photoneutrons from, angular distribution of, 6: 1861

scattering of neutrons by, 6: 980

tissue distribution of, in rats, 6: 496(R)

Bismuth (liquid)

corrosive effects on metals and alloys, 6: 900

Bismuth-cadmium alloys

phase studies of, 6: 1469(R)

Bismuth isotopes Bi²⁰³

alpha emission from, 6: 1416

Bismuth isotopes Bi²⁰⁷

gamma emission of, accompanying K-capture decay, 6: 1915(J)

Bismuth isotopes Bi²⁰⁹

mass determination of, 6: 1283

Bismuth isotopes Bi²¹⁰

beta spectra of, theory, 6: 408, 1356(J), 1909

blackening of photographic plates by ρ particles from, 6: 1287

bremsstrahlung from, angular correlation and intensity of, 6: 1047

electron spectra of, 6: 954(R)

evaporation and deposition of, on a Cu disk, 6: 1501(J)

isomeric states of, 6: 414

positive particles near a source of, 6: 1049(J)

spectra of, 6: 1304(R)

Bismuth isotopes Bi²¹¹

formation, half lives, and alpha emission of, 6: 411

Bismuth isotopes Bi²¹²

alpha emission from, 6: 438(J)

internal conversion lines of, 6: 995(J)

Bismuth-lead alloys (liquid)

corrosive effects of, 6: 1723

thermal expansion of, 6: 1723

Bismuth-lead eutectic

corrosive effects of, on metals and alloys, 6: 901

heat-transfer characteristics of, under forced convection, 6: 1712

heat transfer to molten, in turbulent pipe flow, 6: 1200(R)

Bitter Creek Group (Colorado)

uraniferous clays in, occurrence and analysis of, 6: 1458

Blood

analysis of, for polyglucose, 6: 1652

dialysis of, as related to survival after lethal doses of x-radiation, 6: 1378

Li content of, 6: 16(J), 17(J)

Blood cells

(See also Erythrocytes.)

protection against radiation injuries of, by bone marrow injections, 6: 763

uptake of P³² by, effect of insulin on, 6: 790

Blood picture

effects of radiation on, 6: 1599

Blood plasma

alkaline phosphatase level of, effect of aurintricarboxylic acid on, 6: 1616

effects of total body x-radiation and surgical trauma on polysaccharide and and sulfhydryl levels in, 6: 1594

exchange of K of, with K of body tissues in rats, 6: 1110

ferritin determination in, 6: 1600

potassium exchange rate in, of rabbit, 6: 1111

- Blood plasma (cont'd.)**
 sulfhydryl content of, as affected by radiation and surgical trauma, 6: 1593
- Blood plasma substitutes**
 (See also specific substitutes, e.g., Dextran.)
 polyglucose, in shock treatment, 6: 1652
 preparation of, 6: 163
 tissue distribution of, 6: 1115
 toxicology of tapioca dextrin, 6: 1617
- Blood transfusions**
 effects on tumors, 6: 65(J)
 radiosensitivity effects on dogs, 6: 516(R)
- Blood vessels**
 (See also Capillaries.)
 vasodepression of, by ferritin following irradiation, 6: 1600
- Blood volume**
 measurement of, in organs of rats, 6: 765
- Blue Jay Mine (Colorado)**
 uranorthite in, occurrence and identification of, 6: 1453
- Body fluids**
 (See also Blood; Lymph.)
 radiometric analysis of, 6: 1116
 volumetric determination of, 6: 529
- Boiling**
 effects on heat transfer, 6: 1443
 heat transfer, 6: 871(J)
 rate of, in liquids under free convection, 6: 872(J)
- Bolometers**
 (See also Thermometry.)
 response of, when subjected to modulated radiation, 6: 1787(J)
- Bonds**
 (See also as subheading under specific compounds.)
 hydrogen isotope effect on, in crystals, 6: 550(J)
- Bone marrow**
 radiosensitivity effects of injections of, 6: 57(J), 763
- Bone tumors**
 induced by Ra, 6: 787
- Bones**
 (See also Hematopoietic system.)
 alkaline phosphatase activity of, effects of α -particles on, 6: 28
 calcification of, effects of phosphates on, 6: 21(J)
 density of, radiographic measurement of, 6: 60(J)
 deposition of Am, Ca, Pm, Pu, and Sr in, 6: 1389
 deposition of Ga ion in, 6: 494
 deposition of Ra, Ca, and Pu in, 6: 526(R)
 deposition of Ra in, 6: 63(J)
 exchange reactions of carbonate in, 6: 1609
 from Florida phosphate deposits, comparison with Recent bone, 6: 764
 incorporation of phosphate into, mechanism of, 6: 22(J)
- Boron**
 colorimetric determination of, in Al, 6: 1140(J)
 addition of, to aluminum alloy castings for grain refinement, 6: 1253(J)
 ion exchange determination of, 6: 1406(J)
 spectrophotometric determination of, 6: 1655
- Boron carbides**
 high-temperature reactions of, with metals, 6: 1216
 reactions of, with titanium carbide above 1920°, 6: 208(J)
 thermal conductivity of, 6: 915
- Boron chlorides**
 molecular structure of, 6: 136
- Boron compounds**
 detection of thermal neutrons with, dissolved in liquid scintillators, 6: 1286
- Boron fluorides**
 vibrational spectra of solid crystalline, 6: 1666(J)
- Boron hydrides**
 (Covering boranes (B_2H_6 , etc.) metal borohydrides, etc.)
 electron-diffraction analysis of, 6: 108(R)
 molecular structure of, 6: 136
- Boron isotopes B^{10}**
 deuteron bombardment of, γ -rays from 6: 440(J)
 deuteron bombardment of, internal pairs from, 6: 1009(J)
 π^0 mesons from, by proton reactions, 6: 670
 neutron reactions (n, α) $Li^7(\gamma) Li^7$, 6: 493(J)
 photodisintegration of, 6: 371(J)
- Boron isotopes B^{11}**
 deuteron bombardment of, γ rays, 6: 440(J).
 energy levels of, 6: 1010(J)
 gamma emission from, 6: 1009(J)
 π^0 mesons from, by proton reactions, 6: 670
- Boron isotopes B^{11} (cont'd.)**
 nuclear magnetic moments of, 6: 995(J)
 proton reactions (p,n), excitation functions for, 6: 1021(J)
- Boron isotopes B^{12}**
 energy levels of, 6: 1010(J)
- Boron trifluorides**
 analysis of, 6: 639
 infrared absorption spectra of, 6: 155
 preparation and analysis of, for neutron detection, 6: 639
- Borosilicate glass**
 color centers in irradiated, 6: 1419(J)
- Boundary layer**
 flow of, near a stagnation point, 6: 1716(J)
- Brain**
 effects of x radiation on, 6: 42(J)
- Brass**
 (See also Copper-zinc alloys.)
 annealing textures in rolled, 6: 1242(J)
 cathodic sputtering of, 6: 252
 etching, metallography, and phase studies of, 6: 1469(R)
 porosity of, metallographic studies on, 6: 1474
 proton reactions (p,n), 6: 1535, 1859
 rolling textures in, 6: 1245(J)
- Brass-copper couples**
 porosity of, metallographic studies on, 6: 1474
- Brass single crystals**
 slip in, delay time for the initiation of, 6: 1742(J)
- Breeder Reactors**
 AEC program for, lecture on, 6: 1318
- Bremsstrahlung**
 angular correlations of, with β particles, 6: 688(J)
 angular distribution of, from proton reactions, 6: 337
 cross section for emission of, calculation, 6: 1563(J)
 effects of electron scattering on, in thin anticathodes, 6: 1890(J)
 formation of V^0 particles by, on C and Pb, 6: 1872(J)
 reactions with Cl, Cu(γ ,dp), 6: 1531
 spatial distribution of, effect of electron scattering on, 6: 1889(J)
- Bromine**
 neutron and proton charge-exchange reactions in, 6: 1881(J)
 photoelectron emission from, 6: 1295(J)
 proton scattering cross sections of, 6: 1546
- Bromine complexes**
 equilibrium constants of, 6: 535
- Bromine isotopes Br^{79}**
 nuclear electric moments of, 6: 988(J)
- Bromine isotopes Br^{80}**
 gamma spectra of, 6: 1304(R)
 production and enrichment of, 6: 1698
 retention of, in complex bromides following isomeric transition, 6: 139(J)
- Bromine isotopes Br^{81}**
 deuteron (d,p) cross sections, 6: 1015(J)
 nuclear electric moments of, 6: 988(J)
- Bromine isotopes Br^{82}**
 from Br^{81} (d,p) and Se^{82} (d,2n), 6: 1015(J)
 production and enrichment of, 6: 1698
 Szilard-Chalmers enrichment of, 6: 1420(J)
- Bromine pentafluorides**
 infrared and Raman spectra of, 6: 1668(J)
- Bronze**
 (See also Copper-tin alloys.)
 permeability of, by gas, 6: 1230(R)
- Brookhaven National Lab.**
 meteorological studies at, 6: 677(R)
 progress reports, 6: 492(R), 1552(R), 1746(R)
- Brookhaven reactor**
 power recovery from, 6: 489, 490
- Brookhaven synchrotron**
 design of, 6: 1883
 testing of components of, 6: 1747
- Burros**
 hematology of, 6: 504(R)
- 1,3-Butadiene (labeled)**
 synthesis of, 6: 1181(J)
- Butadiene, diphenyl-**
 fluorescence of, α - or γ -induced, 6: 653(R)
- Butane, monofluoro-2-trifluoromethyl-**
 molecular dipole moments of, 6: 131(J)
- 2,3-Butanedione peroxide**
 decomposition of, in acetic acid-2- C^{14} , 6: 854

1-Butanethiol

reaction with cyclobutene, hexafluoro-, 6: 1160(J)

2-Butanone, 3-hydroxy- (labeled)

synthesis of, 6: 174(J)

Butyric acid, α -bromo-

polarographic behavior of, 6: 538

Cadmium

crystal structure of, 6: 235(R)

electrolytic separation of, from V, 6: 90(R)

gravimetric determination of, using 2-(hydroxyphenyl)-, benzoxazole
6: 1654

x-ray spectra of, 6: 97(J)

Cadmium crystals

plastic deformation in, x-ray and micrographic study of, 6: 1255(J)

Cadmium-gold alloys

phase studies of, 6: 1238(R)

phase transformations and thermal expansion of, 6: 600(R)

Cadmium iodide crystals

dislocations and spiral growth of, 6: 1410(J)

Cadmium iodidesfluorescence of, effects of temperature and type of radiation on, 6:
301(J)**Cadmium isotopes Cd^{110}**

internal conversion in, 6: 1919(J)

Cadmium isotopes Cd^{111}

energy levels of, 6: 1352(J)

excitation curve of, under neutron bombardment, 6: 407(R)

gamma rays from, angular correlations of, 6: 417(J)

nuclear magnetic moments of 247-kev level of, 6: 347(J)

Cadmium-magnesium alloys

entropy and specific heat of, 6: 1472(R)

heats of formation of, 6: 1480(J)

thermodynamic properties of formation of, 6: 1479(J)

Cadmium single crystals

x-ray asterisms from deformed, 6: 1254(J)

Cadmium thiocyanate complexes

polarographic study of, 6: 98(J)

Cadmium tungstate crystals

scintillation efficiency of, effects of pressure on, 6: 826

Cadmium zinc sulfides

fluorescence and conductivity of, 6: 853(R)

Calamity Mesa (Colorado)

uraniferous clays in, occurrence and analysis of, 6: 1458

Calcite

determination of, in carbonate-bearing apatites, 6: 1452

Calcium

bone deposition of, 6: 526(R), 1389

determination of, in Na metal, 6: 815

infrared spectra of, calculations, 6: 161(J)

spectrographic determination of, in organic solids, 6: 158

tissue distribution of, during histaminic shock, 6: 529

Calcium complexes

dissociation of, in aqueous solutions, 6: 564(J)

with fatty acids, formation constants of, 6: 77

Calcium fluorides

coloration and luminescence of, 6: 142(J)

effects of x radiation on photoelectric current in, 6: 1168(J)

Calcium iodides

scintillation properties of Tl-activated, 6: 1806(J)

Calcium isotopes Ca^{39}

beta spectra and half lives of, 6: 735

Calcium isotopes Ca^{40}

nuclear stability of, 6: 1314(J)

Calcium isotopes Ca^{42}

binding energy of, calculation, 6: 333(J)

mass of, 6: 991(J)

Calcium isotopes Ca^{43}

mass of, 6: 991(J)

Calcium isotopes Ca^{44}

mass of, 6: 991(J)

Calcium isotopes Ca^{45}

beta emission of, 6: 1511

Calcium isotopes Ca^{46}

mass of, 6: 991(J)

nuclear stability of, 6: 1314(J)

Calcium nitrates

distribution of, between water and 1-hexanol, 6: 102

Calibration

(See also as subheading.)

statistical methods in, 6: 951

Calorimeters

adiabatic, design of, 6: 868

for measuring heat capacity of corrosive liquids, 6: 1164(R)

sensitivity and thermal capacity of, 6: 960(R)

Calutrons

charge materials for stable isotope separation, survey of, 6: 1791

Cameras

Buerger precession, 6: 617

gamma-ray pinhole, for tumor location, 6: 521

for low temperature work, 6: 244(J)

for use with Wilson cloud chambers, 6: 945(J)

Canadian reactors

(See NRX reactor.)

Cancer

(See Carcinomas, Sarcomas, and Tumors.)

Capillaries

(See also Blood vessels.)

fragility of, as a factor in anemia following irradiation, 6: 1599

permeability of, induced by radiation, 6: 25, 1598

Caproic acid, α -bromo-

polarographic behavior of, 6: 538

Caprylic acid, α -bromo-

polarographic behavior of, 6: 538

Carbamic acid, ethyl ester

protective action of, against x radiation, 6: 1386(J)

Carbazyl, picryl-N-amino-

paramagnetic resonance absorption of, 6: 1166

Carbohydratesbiosynthesis of, by *ustilago zeae*, 6: 759

ion exchange separation of, from plant extracts, 6: 101

metabolism of, effects of K on, 6: 758

Carbon

(See also Diamonds; Graphite.)

absorption of cosmic particles in, 6: 260(J)

absorption of cosmic photons in, 6: 258(J)

adsorption of A, N, and methanol on, 6: 1425(R)

adsorption of O on, as factor in combustion, 6: 1669(J)

coherent neutron scattering amplitude of, 6: 1903(J)

combustion and mounting techniques for radioactive, 6: 1650

combustion determination of, 6: 106, 592

corrosion of, by H_2O_2 , 6: 240(J)

electron scattering by, 6: 1035(J)

energy spectra of protons scattered from, 6: 388, 1753

formation of V^0 particles by bremsstrahlung on, 6: 1872(J)gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538gamma reactions (γ, p), 6: 701

infrared spectra of, calculations, 6: 161(J)

interactions of π mesons with, 6: 1823(J) π^0 -mesons from, by photon reactions, 6: 317metabolism of, as related to C^{14} radiotoxicology, 6: 1609

neutron and proton charge-exchange reactions in, 6: 1881(J)

neutron total cross sections for, 6: 1017(J), 1023(J), 1525, 1526

nuclear momentum distribution in, inferred from proton scattering, 6:
1841

penetrating showers produced in, by cosmic radiation, 6: 266(J)

proton reactions (p, n), 6: 370(J), 1887proton reactions (p, p^0), 6: 1865proton reactions (p, π^0), γ spectra from, 6: 362

proton scattering cross section of, 6: 1546

proton spectra of, 6: 1821(R)

ratio of, to P in photosynthesis intermediates, 6: 168

transition probabilities for diatomic, by dipole velocity operator, 6: 256

Carbon bromides

electric conductivity and molecular properties of, 6: 1415

Carbon chlorides

electric conductivity and molecular properties of, 6: 1415

Carbon dioxides

determination of, bibliography on, 6: 110

fixation of, in barley roots, 6: 1703

ionization potentials of, by mass spectrography, 6: 291(J)

metabolism of, in *Scenedesmus*, 6: 531

metabolism of, in x-irradiated dogs, 6: 510(R)

self diffusion in, at moderate pressures, 6: 934

self diffusion in, up to 150 atm pressure, 6: 801

thermo-osmosis of, through rubber, 6: 1776(J)

Carbon ion beams

electron pickup by, in nuclear emulsions, 6: 656

Carbon isotopes

- determination of, in organic compounds, 6: 104
- energy levels of α -particle models for, 6: 691(J)
- equipment for estimating radioactive, 6: 663(J)
- gamma spectra of, produced by the $B^{10}(p,n)$ reaction, 6: 1911
- isotopic effect of, on decarboxylation of oxalic acid, 6: 832
- relative abundance of, in nature, 6: 1793

Carbon isotopes C^{11}

- energy levels of, 6: 987
- formation of, by proton bombardment of Cu, 6: 700
- gamma emission from, 6: 1009(J)

Carbon isotopes C^{12}

- deuteron reactions (d,n), 6: 708(J)
- energy levels of, 6: 699, 987
- formation of, by $N^{14}(d,\alpha)$, 6: 1870(J)
- gamma reactions (γ,α), 6: 699, 709(J), 1331(J)
- gamma reactions (γ,n), 6: 963, 1871(J)
- gamma reactions (γ,n), resonances in, 6: 372(J)
- mass of, 6: 991(J), 1793
- π^- mesons from, by proton reactions, 6: 974
- π^0 mesons from, by proton reactions, 6: 670
- neutron reactions (n,p), 6: 1821(R)
- photodisintegration of, 6: 1861
- photodisintegration of, α,α correlations in, 6: 704(J)
- proton bombardment of, 6: 376(J)
- proton reactions (p, γ), 6: 1879(J)
- proton reactions (p, γ'), 6: 1533
- proton reactions (p,p'), γ spectrum from, 6: 1918(J)
- shell model calculation of the photodisintegration of, into three α particles, 6: 1003

Carbon isotopes C^{13}

- binding energy of, calculation, 6: 333(J)
- neutron scattering cross sections of, 6: 1548
- properties of energy states of, 6: 1859
- proton capture cross sections of, 6: 1875(J)
- proton reactions (p,n), excitation functions for, 6: 367(J), 1021(J)
- radiometric determination of, 6: 1628
- spectra of, isotope shifts in, 6: 445

Carbon isotopes C^{14}

- determination of, in organic compounds, 6: 1408(J)
- determination of, in relics, 6: 755(J)
- isotopic chemical effects of, in biological systems, 6: 1387
- isotopic chemical effects of, in decarboxylation of malonic acids, 6: 831
- measurement of, with CO_2 ionization chambers, 6: 654
- metabolism of, 6: 526(R)
- nuclear properties of, 6: 1928
- permissible limits of, for bone, 6: 1609
- proton reactions (p,n), 6: 407(R)

Carbon monoxides

- oxidation of, over CuO^{18} , 6: 177(J)

Carbon steel

- cerium impregnation of surface layers of, 6: 912(J)

Carbonates

- bone turnover of, as affected by age, growth, body size, duration of exposure to CO_2 , and ambient CO_2 concentration, 6: 1609

Carbonyl compounds

- carbonyl ion rearrangements, 6: 1533

Carbonyl sulfides

- microwave spectra of isotopic, 6: 340(J)

Carcinogens

- (See also specific carcinogens; see also Carcinomas.)
- effects of deuteron bombardment on, 6: 1170(J)

Carcinomas

- (See also specific carcinomas, organs, tissues, animals, etc.; see also Carcinogens and Sarcomas.)
- growth rate of mammary, before and after irradiation, 6: 1091(J)
- radiotherapy of, with I^{131} , 6: 68(J)
- radiotherapy of, with Co^{60} , 6: 1105(J)

Caribou Mine (Colorado)

- uranium occurrence at, 6: 213

Carnegie Inst. of Tech.

- progress reports, 6: 597(R)

Carnotite ores

- (See also Uranium ores.)
- detection of, by α -particle emission from drill cores, 6: 211

Carotenoids

- occurrence in blue-green algae, 6: 14

Case Inst. of Tech.

- progress reports, 6: 680(R)

Casy Lease (Colorado)

- prospecting of, for U, 6: 1456

Catalases

- inactivation of, by fast deuterons, heat, and a combination of the two, 6: 1602(J)

Catalysis

- mechanism of, of oxidation of CO, 6: 177(J)

Cataracts

- radioinduced, in mice, 6: 506(R), 763
- radioinduced, in rabbits, 6: 505

Cathode-ray tubes

- calibration unit for, 6: 1579(P)
- in color television, 6: 1834

Cathodes

- (See also Electrodes; Electron tubes; Electrons—emission; Mercury cathodes.)
- sputtering of metal from, for micro-diffusion studies, 6: 252

Cavity resonators

- spheroidal, resonance of small spheroidal object in, 6: 253

Cells

- (See Animal cells; Cytology; Dry batteries; Plant cells.)

Cellulose

- effects of radiation on, 6: 493(J)

Cements

- (See also Mortars.)
- corrosion of, by H_2O_2 , 6: 240(J)
- properties of, 6: 1437

Centrifugal pumps

- Hayward-Tyler, cleaning of, 6: 1443

Ceramic coatings

- (See also subheadings under base materials and units being coated.)
- testing of, for wet exhaust mufflers and piping, 6: 203

Ceramic materials

- (See also Refractory materials.)
- dielectric properties of, measured by electromagnetic resonators, 6: 1493
- interactions of, with metals at high temperatures, 6: 205

Ceramic-metal couples

- interfacial reactions of, 6: 1449(R)

Cerium

- fractional-precipitation separation of, from La, 6: 1174(J)
- impregnation of steel with, 6: 912(J)
- production of, by electrolytic and thermal reduction processes, 6: 1688(J)
- thermodynamic properties of, 6: 560, 840

Cerium chlorides

- activity coefficients, conductances, and transference numbers of, 6: 562
- activity coefficients of, in aqueous solutions, 6: 558
- thermodynamic properties of, 6: 560, 839
- transference numbers of, 6: 563

Cerium compounds

- thermodynamic properties of, 6: 840

Cerium ions

- oxidation and reduction of, by radiation, 6: 146(J)

Cerium isotopes Ce^{140}

- preparation of carrier-free, 6: 1422
- spins of excited states of, from $La^{140}\beta$ decay, 6: 1917(J)

Cerium isotopes Ce^{141}

- decay schemes of, 6: 424(J)

Cerium oxalates

- thermodynamic properties of, 6: 560

Cerium oxide-praseodymium oxide systems

- reduction of, by H_2 , 6: 1683(J)

Cerium oxide-thorium oxide systems

- reduction of, by H_2 , 6: 1683(J)

Cerium oxides

- reduction of, by H_2 , 6: 1683(J)

Cerium(III) sulfate complexes

- dissociation constant of, 6: 1682

Cerium sulfates

- paramagnetic resonance absorption in, 6: 1359(J)

Cermets

- sintering of, equipment for studying, 6: 205

Cesium

- chromatographic separation of, from Rb and K, 6: 848(J)

Cesium iodides

- scintillation properties of Tl-activated, 6: 1806(J)

Cesium isotopes

- nuclear properties of, 6: 1928

Cesium isotopes Cs^{134}

- decay schemes of, 6: 689(J)
- gamma emission from, polarization and angular correlation of, 6: 430(J)
- nuclear spin of, 6: 1909

- Cesium isotopes Cs¹³⁴ (cont'd.)
 preparation of carrier-free, 6: 1422
 spectra of, 6: 742(J)
- Cesium isotopes Cs¹³⁵
 preparation of carrier-free, 6: 1422
- Cesium isotopes Ca¹³⁶
 yield and half lives of, from U²³³ and U²³⁵ fission, 6: 1857
- Cesium vanadium sulfates
 absorption spectra of, 6: 1647(J)
- Chain reactions
 (General theory of nuclear chain reactions; see also specific fissionable isotopes; see also Criticality studies; Multiplication factor; and Reactors—theory.)
 production of first, at Univ. of Chicago, 6: 353
- Chalk River reactor
 (See NRX reactor.)
- Chelates
 chemical stability of, 6: 1632
 toxicology of, 6: 496(R)
- Chemical analysis
 (See also specific methods of analysis.)
 by measurement of nuclear magnetic resonance, 6: 1142(J)
- Chemical radiation detectors
 (See also Radiation detection instruments—colorimetric.)
 calibration and performance of, 6: 1343
- Chemical warfare
 eddy-diffusion theory in relation to, 6: 756
 meteorological aspects of, 6: 757
- Chemical warfare agents
 (See also specific agents.)
 dispersal of, 6: 757
- Cherenkov radiation
 counter for measurement of, 6: 1512
 detection and measurement of, 6: 299
 from irradiated U in H₂O, 6: 1511
- Chloride complexes
 equilibrium constants of, 6: 535
- Chlorides
 fluorination of, with ammonium fluoride, 6: 133(J)
 metabolism of, in x-irradiated dogs, 6: 510(R)
- Chlorine
 effects on incorporation of phosphate into lipides by liver slices, 6: 799
- Chlorine isotopes Cl³³
 beta spectra and half lives of, 6: 735
- Chlorine isotopes Cl³⁴
 gamma spectra of, 6: 1351(J)
- Chlorine isotopes Cl³⁵
 mass of, 6: 991(J)
 nuclear magnetic moment and coupling constants of, 6: 1310(J)
 nuclear quadrupole resonance lines of, theory, 6: 341(J)
 quadrupole resonance of, in p-C₆H₄Cl₂, 6: 692(J)
 quadrupole spectra and couplings of, in substituted methanes, 6: 1308(J)
- Chlorine isotopes Cl³⁶
 blackening of photographic plates by β particles from, 6: 1287
 nuclear properties of, 6: 1928
- Chlorine isotopes Cl³⁷
 mass of, 6: 991(J)
 nuclear magnetic moment and coupling constants of, 6: 1310(J)
 proton reactions (p,n), 6: 407(R)
 proton reactions (p,n), excitation functions for, 6: 1021(J)
 quadrupole resonance of, in p-C₆H₄Cl₂, 6: 692(J)
- Chlorine isotopes Cl³⁸
 in reducing ascites, 6: 1595
- Chlorohydrocarbons
 (See also Halohydrocarbons.)
 fluorination of, with SbF₃, 6: 1664(J)
- Chloroorganic compounds
 (See also specific organic compounds; see also Halohydrocarbons.)
 proton stopping by, 6: 718
- Chlorophylls
 absorption spectra of, 6: 159
 occurrence in blue-green algae, 6: 14
 role of, in "Hill reaction," 6: 498
- Chloroplasts
 back reaction in photolysis of H₂O by, 6: 567
 evolution of O₂ by isolated, 6: 534
 luminescence of, potentiometric measurement, 6: 1601(J)
- Cholanthrene
 changes in chemical properties of, after irradiation, 6: 1170(J)
- Cholesterol
 changes in chemical properties of, after irradiation, 6: 1170(J)
 metabolism of, 6: 497(R)
- Cholesterol (labeled)
 biosynthesis of, by liver slices, 6: 174(J)
- Chromium
 by-product recovery of, from titaniferous magnetite, 6: 911(J)
 freezing point of, 6: 1259(J)
 neutron cross sections of, 6: 1304(R), 1526
 polarographic determination of, in Al alloys, 6: 1407(J)
 scattering of neutrons by, 6: 980
- Chromium alloys
 sigma phase in, 6: 1246(J)
- Chromium-aluminum compounds (intermetallic)
 x-ray-diffraction analysis of, 6: 199
- Chromium-cobalt-iron-nickel alloys
 creep properties of, effects of cold-work on, 6: 1207
- Chromium-iron alloys
 corrosion of, by liquid Bi, 6: 900
- Chromium isotopes Cr⁴⁸
 formation of, in Fe spallation, 6: 1862
- Chromium isotopes Cr⁵¹
 decay schemes of, 6: 650(R)
- Chromium isotopes Cr⁵²
 binding energy of, 6: 989(J)
- Chromium isotopes Cr⁵³
 proton reactions (p,n), 6: 359, 407(R)
- Chromium isotopes Cr⁵⁴
 proton reactions (p,n), 6: 359, 407(R)
- Chromium-manganese alloys
 phase studies of, 6: 1259(J)
- Chromium-niobium alloys
 crystal structure of, from x-ray-diffraction data, 6: 1249(J)
- Chromium-tantalum alloys
 crystal structure of, from x-ray-diffraction data, 6: 1249(J)
- Chromium-uranium alloys
 crystal structure of, 6: 121(J)
 crystal structure of β phase, 6: 1183
 magnetic susceptibility of, 6: 1433
- Chromium-zirconium alloys
 constitution diagrams of, 6: 591(R)
- Chromosomes
 (See also Genetics and Mitosis.)
 effects of O₂ on x-ray induced aberrations in, 6: 24
 effects of radiation on, 6: 39(J), 769(J)
 x- and γ -ray-induced aberrations in, effects of infrared radiation on, 6: 27
 x- and γ -ray-induced and O₂-induced aberrations in, 6: 4
 x-ray-induced aberrations in, effects of O₂ and temperature in, 6: 26
- Chymotrypsin
 protection by competitive inhibitors against radiatic damage of, 6: 1094
- Circulatory diseases
 (See also Blood vessels.)
 chemotherapy of, 6: 497(R)
- Clay deposits (uraniferous)
 uranium occurrence in, 6: 1728(J)
- Clays (uraniferous)
 occurrence and analysis of, from Dyamite Mine, Bitter Creek Group, Montrose Co., and Calamity Mesa, Mesa Co., Colorado, 6: 1458
- Cloud chambers
 camera for use with, 6: 945(J)
 continuously sensitive, design of, 6: 664(J)
 for cosmic radiation detection, 6: 962(R)
 high pressure diffusion, design of, 6: 316
 timing apparatus for, 6: 478(P)
- Cloud-ion chambers
 design and operation of, 6: 1815(J)
- Cobalt
 anion exchange of, in HCl, 6: 1689(J)
 neutron diffraction pattern for, 6: 1038(J)
- Cobalt alloys
 corrosion of, by liquid Bi, 6: 900
- Cobalt(II) chlorides
 solvation of, in water and acetone, 6: 78
- Cobalt(II) fluorides
 neutron diffraction analysis of, 6: 1548
- Cobalt-chromium-iron-nickel alloys
 creep properties of, effects of cold-work on, 6: 1207
- Cobalt complexes
 dissociation of, in aqueous solutions, 6: 564(J)
 magnetic properties of, 6: 1628
 with 2-methyl-8-quinolinol, stability of, 6: 1141(J)

- Cobalt-iron alloys
recrystallization of, effects of, magnetic field on, 6: 601(R)
- Cobalt isotopes Co⁵⁹
deuteron reactions (d,p)Fe⁵⁹, 6: 1790
mass of, 6: 368(J)
proton reactions (p,n), threshold of, 6: 368(J)
- Cobalt isotopes Co⁶⁰
decay schemes of, 6: 650(R)
gamma emission from, anisotropy of, 6: 997(J)
gamma emission from, polarization and angular correlation of, 6: 430
430(J)
gamma-gamma angular correlation in, 6: 1913(J)
half lives of, measured by differential ionization method, 6: 1357(J)
internal conversion and isomeric transition of, 6: 409
mixture with plastics for use in radiotherapy, 6: 1107(J)
polarization of γ rays from, by double scattering, 6: 1898(J)
preparation and use of radiotherapy units of, 6: 1102(J)
in treatment of non-resectable head and neck cancer, 6: 1103(J)
in treatment of uterine carcinomas, 6: 1105(J)
unit for cancer therapy with, at Univ. Hospital, Saskatoon, Canada, 6: 786(J)
- Cobalt isotopes Co⁶¹
decay schemes of, 6: 1354(J)
from Cu⁶⁵ (γ, α), 6: 1012(J)
- Cobalt nitrates
distribution of, between water and 1-hexanol, 6: 102
electric conductivity of, in acetophenone, 6: 84
- Cobalt-uranium alloys
of composition UCo₂, 6: 471(P)
magnetic susceptibility of, 6: 1433
- Cobalt-uranium compounds (intermetallic)
of composition U₂Co, 6: 472(P)
- Cockcroft-Walton accelerators
for acceleration of H² and He³ ions, 6: 1886(J)
- Coincidence circuits
(Circuits peculiar to specific instruments are indexed with the instruments.)
for cosmic radiation detection, 6: 610(R)
design of, 6: 634(J)
in fluorescence and conductivity studies, 6: 1392(R)
multiple channel, design of, 6: 297
pulse-equalizing, for scintillation counters, 6: 1798
radio telemetering in, 6: 1265(J)
- Colchicine
effects of x radiation and, on cells, 6: 36
- Colitis
fecal lysozyme titer in, effect of ACTH on, 6: 9
- Collagen
effects of radiation on, 6: 493(J)
- College of Sciences and Arts, State Coll. of Wash.
progress reports, 6: 535(R)
- Colorado (Boulder County)
exploration of Caribou Mine area, 6: 213
uraniothorite in Blue Jay Mine, occurrence and identification of, 6: 1453
- Colorado (Clear Creek County)
prospecting of Robineau Claims, 6: 214
- Colorado (Larimer Co.)
geology and prospecting of Case Lease, Treasure Hill Area, Treasure Hill Claims, and West Point Claim for U, 6: 1456
- Colorado (Mesa Co.)
uraniferous clays in, occurrence and analysis of, 6: 1458
- Colorado (Montrose Co.)
uraniferous clays in, occurrence and analysis of, 6: 1458
- Colorado Plateau
6: 891(R)
- Columbia Radiation Lab., Columbia Univ.
progress reports, 6: 1782(R)
- Columbia River
radioactive plankton from, 6: 513
- Columbia Univ.
progress reports, 6: 600(R), 1304(R), 1469(R)
- Columbia Univ. School of Mines
progress reports, 6: 1173(R), 1238(R)
- Communication systems
theory of, 6: 1750(R)
- Computers
(Calculating devices; mechanical and electrical. See also Reactor simulators.)
design and operation of, 6: 939, 940, 1750(R)
an FM-AM multiplier, design and performance of, 6: 1781
line divider as an aid in calculating graphs, design of, 6: 1784
- Concrete aggregates
(See also specific materials used as aggregates.)
preparation of high-density, using pressure grouting and other methods, 6: 1437
- Concretes
(See also Cements.)
corrosion of, by H₂O₂, 6: 240(J)
polyethylene coatings for, specifications, equipment and methods of application of, 6: 1724
preparation of high-density, using pressure grouting and other methods, 6: 1437
properties and preparation of, using pumice as aggregate, 6: 1206
- Congo ores
(See Pitchblende.)
- Constants and conversion factors
(Includes only miscellaneous constants not covered specifically elsewhere.)
for pile engineering, 6: 1482
- Contamination
(See also Radioactive contamination.)
mathematical analysis of diffusion of, from a single source, 6: 1442
measurement of, in vacuum systems, 6: 1804(J)
- Convection
(See also Heat transfer.)
equation of thermal, 6: 623(J)
magneto-hydrodynamic effects on, in a magnetic field, 6: 1715(J)
- Convection (forced)
effects on effectiveness of heaters, 6: 581(J)
heat transfer, 6: 871(J)
heat transfer by, in Pt tubes, 6: 887
at high velocities and temperatures, measurement of, 6: 1717(J)
- Convection (free)
heat transfer, 6: 873(J)
rate of boiling of liquids under, 6: 872(J)
- Conversion electrons
(See also subheading beta emission under specific isotopes; see also Beta particles.)
angular correlation between, and other cascade radiation, 6: 1844(J)
- Copper
annealing textures in rolled, 6: 1242(J)
bremsstrahlung reactions (γ, dp), cloud chamber identification of, 6: 1531
cathodic sputtering of, 6: 252
corrosion of, by H₂O₂, 6: 240(J)
creep of, under deuteron bombardment, 6: 893
determination of, by pile activation, 6: 549(J)
deuteron range-energy relation in, 6: 1032(J)
dynamic coefficients of, 6: 245(J)
electric conductivity of, effect of elastic deformation in, 6: 241(J)
electrolytic separation and determination of, 6: 1138(J)
electron scattering by, 6: 1035(J)
electroplating of, 6: 599(R)
extinction in, 6: 605(J)
gamma absorption in, 6: 1533
gamma reaction (γ, n) at 320 and 160 Mev, 6: 1538
gamma reactions (γ, p) and (γ, d), 6: 1532
grain growth in, 6: 230
meson scattering cross sections, 6: 319
 π^- -meson scattering cross sections, 6: 319
 π^0 -mesons from, by photon reactions, 6: 317
metabolism of, in *Drosophila*, 6: 1114
neutron cross sections of, 6: 1526
neutron scattering cross sections of, 6: 1304(R)
oxidation rate of, as function of temperature and pressure, 6: 896
penetrating cosmic showers in, 6: 1757(J)
proton bombardment of, distribution of products of, 6: 360
proton bombardment of, formation of light nuclei by, 6: 700
rolling textures in, 6: 1245(J)
scattering of neutrons by, 6: 980
tissue distribution of, in *Drosophila* larvae, 6: 1595
- Copper alloys
(See also Brass and Bronze.)
corrosion of, by H₂O₂, 6: 240(J)
- Copper-aluminum alloys
aging of, x-ray-diffraction study of, 6: 244(J)
- Copper-aluminum compounds (intermetallic)
crystal structure of, 6: 827(J)
- Copper-aluminum-magnesium alloys
aging of, x-ray-diffraction study, 6: 244(J)
constitution diagrams of, 6: 243(J)

- Copper-brass couples
porosity of, metallographic studies on, 6: 1474
- Copper chlorides
catalysis of ascorbic acid oxidation by, 6: 803
- Copper coatings
thickness measurements of, on cylinders by x-ray-diffraction analysis, 6: 1486
- Copper complexes
with cyanide, in oxidation-reduction reactions, 6: 813
dissociation of, in aqueous solutions, 6: 564
equilibrium constants of, 6: 535
with 2-methyl-8-quinolinol, stability of, 6: 1141(J)
spectrophotometric studies of, 6: 1393(R)
- Copper compounds
chelation of, with β -diketones, 6: 1634
paramagnetic resonance and hfs of divalent, 6: 1847(J)
- Copper electrodes
electric breakdown between, effect of surface treatment on, 6: 271
- Copper-gold alloys
electric conductivity of, effects of radiation on, 6: 493(J)
ordering kinetics in, 6: 115
- Copper ions
inhibition of Ti corrosion by, 6: 588
- Copper isotopes Cu⁶²
production of, in betatron, 6: 279(J)
- Copper isotopes Cu⁶³
gamma reactions (γ, n), 6: 1871(J)
nuclear electric moments of, 6: 1309(J)
triton reactions of, 6: 705(J)
- Copper isotopes Cu⁶⁵
gamma (γ, α) cross sections, 6: 1012(J), 1861
gamma reactions (γ, n), 6: 1871(J)
nuclear electric moments of, 6: 1309(J)
triton reactions of, 6: 705(J)
- Copper isotopes Cu⁶⁶
gamma spectra, 6: 1923(J)
nuclear spin and decay of, 6: 1051(J)
- Copper-nickel alloys
diffusion in, 6: 603(R)
- Copper-nickel couples
porosity of, metallographic studies, 6: 1474
- Copper-nickel-zinc alloys
casting, corrosion, and physical properties of, 6: 1465
- Copper-silicon alloys
plastic deformation of, 6: 618(R)
- Copper-silicon single crystals
plastic deformation of, 6: 1470(R)
- Copper single crystals
plastic deformation of, 6: 618(R), 1470(R)
plastic flow in, 6: 603(R)
- Copper-tin alloys
(See also Bronze.)
phase studies of, 6: 1238(R)
phase transformations in, 6: 600(R)
- Copper-zinc alloys
(See also Brass.)
diffusion in, 6: 603(R)
grain boundary diffusion in, 6: 1473(R)
- Copper-zinc couples
diffusion of Zn in, 6: 601(R)
- Copper-zirconium alloys
constitution diagrams of, 6: 591(R)
- Cornell Univ.
progress reports, 6: 108(R)
- Corrosion
(See also subheadings corrosion under corroded materials and units, and corrosive effects under corrosive agents.)
symposium on, minutes of, 6: 210
testing equipment, 6: 234
- Corrosion inhibitors
efficiency of Fe and Cu ions as, 6: 588
properties of, for use on ball bearings, 6: 1218
- Cortisone
radiosensitivity effects on chicks, 6: 763
- Cosmic electrons
detection of, counter arrangement for, 6: 924
energy of, 6: 613(J)
energy spectrum of, by absorption in Al and Pb, 6: 262(J)
measurement of, multitelescope and hodoscope unit for, 6: 923
scarcity of primary, 6: 927(J)
- Cosmic mesons
differential range intensity and momentum distribution of, 6: 929(J)
neutrons produced by capture of μ , in Pb, 6: 1759(J)
probability of production of showers of, 6: 926(J)
production and energy distribution of π and μ , and relation to primary-nucleon spectrum, 6: 1762(J)
zenithal variation of, 6: 1299(J), 1763(J)
- Cosmic neutrons
latitudinal variations in intensity of, 6: 268(J)
production of stars and single tracks by, in nuclear emulsions, 6: 1267(J)
- Cosmic particles
(See also headings by name, e.g., Cosmic electrons; see also Electrons; Mesons, etc.)
absorption of, in H₂ and C, 6: 260(J)
charge on primary, 6: 1512
electron-nuclear shower producing, disintegration of, 6: 263(J)
high-energy disintegrations initiated in nuclear emulsions by primary, 6: 1761(J).
identification of, in nuclear emulsions, 6: 1289(J)
measurement of, by pulse ionization chamber, 6: 928(J)
multiple meson production by, in H₂, 6: 267(J)
stars produced in AgCl by ionizing, 6: 1760(J)
- Cosmic protons
momentum distribution of, 6: 269(J), 929(J)
star production by, in nuclear emulsions, 6: 611(J)
- Cosmic radiation
(See also specific particles identified with cosmic radiation, e.g., Cosmic neutrons.)
absorption in atmosphere, measurement of, 6: 1268(J)
absorption of photons in, in Pb, Sn, Fe, Al, C, and paraffin, 6: 258(J)
associated penetrating particles of, underground, 6: 257(J)
biological effects of, evaluation of present day knowledge, 6: 1596
counting of, a combinatorial problem in, 6: 615(J)
deduction of spectrum of primary nucleons of, from μ -meson spectrum, 6: 1762(J)
detection and measurement of, spark counters for, 6: 969(J)
dosage of, at high altitudes, 6: 497(R)
east-west asymmetry of, equipment, for measuring, 6: 610(R)
effects of solar activity on, 6: 1767(J)
gamma components of, 6: 612(J)
high-energy interaction in, emulsion cloud chamber study of, 6: 925
high-energy primary flux of, detection and measurement of, 6: 1489
intensity of heavy primaries in, 6: 928(J)
ionizing power of, at sea level, 6: 1764
latitudinal variations in intensity of, 6: 930(J)
meson-proton analysis of, 6: 929(J)
nuclear disintegrations caused by, features of, 6: 1766(J)
origin of, theory, 6: 722(J), 927(J)
penetrating non-ionizing component of, 6: 614(J)
penetrating showers produced by, in Be, 6: 265(J)
penetrating showers produced by, in Pb and C, 6: 266(J)
photographic emulsion study of cascades in, 6: 1765(J)
primary specific ionization of, in H₂, 6: 1758(J)
spectrum of ionizing particles of, 6: 261(J)
star production by, diurnal variation in rate of, 6: 1266(J)
star production by, in nuclear emulsions, 6: 259(J), 1819
transition effect of star-producing, 6: 1269(J)
underground, effects of atmospheric temperature variation in, 6: 1756
zenithal variation of, 6: 1763(J)
- Cosmic showers
density of, 6: 613(J)
density, distribution, and detection probabilities of, 6: 924
detection and measurement of, cloud chamber for, 6: 962(R)
electron-nuclear process in, 6: 1270(J)
photons and electrons in, numbers of, 6: 616(J)
probability of production of, 6: 926(J)
production of penetrating, in Cu, 6: 1757(J)
radio telemetering in detection of, 6: 1265(J)
ratio of penetrating particles to electrons in, 6: 270(J)
- Counting devices
(See also Radiation detection instruments; Radiation detectors.)
for cosmic radiation, 6: 969(J)
electromagnetic, design of, 6: 487(P)
- Couples (metallurgy)
(See also headings for specific couples by name of components.)
porosity of, metallographic studies on, 6: 1474
- Creatinephosphoric acid
fluorimetric analysis of, 6: 1134

- Creep
(See also as subheading under specific materials.)
testing of, instrumentation for, 6: 192
- Criticality studies
(Studies of mass, dimensions, etc., for nuclear critical assemblies; see also criticality studies under specific reactors and under Reactors; also specific fissionable isotopes.)
formula for safe mass in a reactor, 6: 354
- Crotonaldehyde (labeled)
synthesis of, 6: 174(J)
- Cryogenics
6: 1750(R)
bibliographies on, 6: 1484
monograph on, 6: 1484
production of low temperatures by demagnetization, 6: 255(J)
thermometers for use in, 6: 1280(J)
- Cryolite
infrared spectrum and crystal structure of, 6: 1667(J)
- Crystal detectors
(See also Scintillation detectors.)
design of, 6: 1506(R)
for *in vivo* use, 6: 657(R)
for quantitative biological measurement, development of, 6: 763
- Crystal structure
(Including crystal imperfections, lattice distortion, crystal deformation, orientation, superlattices, etc.; see also as subheading under specific materials; see also interfaces; preferred orientation; slip; twins; etc., as subheadings under specific materials.)
determination of, from neutron diffraction data, 6: 619(J)
effects on neutron transmission, 6: 1341
hydrogen isotope effect on, 6: 550(J)
measurement of, at low temperatures, 6: 617
- Crystals
(See also specific materials and subheadings covering crystal phenomena; and main headings by material, e.g., Copper crystals; see also Single crystals.)
hydrogen isotope effect on bonds in, 6: 550(J)
plastic deformation of, theory of, 6: 1660
- Curare alkaloids (labeled)
synthesis of, 6: 570(J)
- Curium isotopes
formation of, 6: 917
- Curium isotopes Cm²⁴⁰
decay schemes of, 6: 917
- Curium isotopes Cm²⁴¹
electron capture of, 6: 917
- Curium isotopes Cm²⁴²
alpha emission of, measurement, 6: 1481
alpha spectra of, 6: 415
decay schemes of, 6: 917
- Current integrators
(See also Electrometers.)
design of, 6: 1278(R)
- Cyanide complexes
with copper, in oxidation-reduction reactions, 6: 813
- Cyanide ions
exchange studies, kinetics of, 6: 1123(J)
- Cyanides
exchange reactions of, with thiocyanate ions, 6: 87
fluorination of, 6: 134(J)
radiosensitivity effects of, 6: 51(J), 520(R)
- Cyclobutene, hexafluoro-
reaction of, with 1-butanethiol, 6: 1160(J)
- Cyclohexane
chemical effects of α particles on, 6: 1421(J)
radiolysis of, effect of I in, 6: 1674
- Cyclohexane, γ -hexachloro-
effects of x radiation on, in alcoholic solution, 6: 1169
- Cyclohexene
chemical effects of α particles on, 6: 1421(J)
- Cyclone precipitators
efficiency of, effect of dust concentration on, 6: 189(J)
- Cyclotrons
(Including F. M. cyclotrons or synchro-cyclotrons.)
acceleration of multiply charged nuclei in, 6: 379
beam collimation of, 6: 1328(J)
beam deflection in, regenerative, 6: 1336(J)
beam deflection in synchro-, 6: 356(J)
notes on a tour of American, and bibliography on, 6: 1024
operation of 60 in., 6: 1821(R)
orbit problems in, 6: 378, 1821(R)
- Cyclotrons (cont'd.)
oscillator design for Argonne 60-in., 6: 1324
stabilization of magnetic field of, 6: 1542(J)
synchro-, design and beam characteristics of, 6: 1883
temperature reduction of, by cleaning magnet heat exchanger, 6: 278(R)
theory of fixed frequency, 6: 1882
trochoidal orbits in, 6: 1025(J)
- Cylinders
heat emission by, in liquids and gases, 6: 1202(J)
heat transfer in infinitely long concentric, theory, 6: 869
heat transfer in split hollow, 6: 1710
transient temperature and thermal stress in infinitely long, 6: 870
- Cysteine
effects on radiosensitivity of tumor cells, 6: 1608
radiosensitivity effects of, 6: 520(R), 1379(R), 1386(J)
- Cytochemistry
application of, in analysis of elements by x-rays, 6: 1101(J)
- Cytology
spectrophotometric methods for study of the cell nucleus, 6: 1374
- Cytoplasm
analysis of, for ribonucleotides, 6: 112(J)
- Decontamination
(See also as subheading under units and materials decontaminated; also as unit operation under specific chemical processes; for studies on the use of special coatings to aid decontamination, see also Coatings and specific coatings, e.g., Paint and Silicone coatings.)
of surfaces, 6: 469(P)
- Density
(Including specific gravity; see also as subheading under specific materials.)
measurement of, by gamma absorption, 6: 937
- Deuterium
(See also Deuterons.)
determination of, by 5 methods, 6: 822(J)
determination of, in organic compounds, 6: 104
deuteron and triton cross sections of, 6: 1859
deuteron cross sections of, 6: 1528
deuteron scattering by and deuteron reactions (d,p) of, 6: 1330(J)
dissociation of, by high-energy γ rays, 6: 703
effects on solvolytic reactions, 6: 1533
energy spectra of protons scattered from, 6: 388, 1753
exchange of, between D₂O and heptane, 6: 122(J)
gamma cross sections of, 6: 1863
gamma reactions (γ,n), yield and energy of neutrons from, 6: 1829
gamma reactions (γ,p), 6: 680(R)
inelastic scattering of neutrons by, 6: 1031(J)
mass spectrographic determination of, in H-D mixtures, 6: 547
 π meson scattering cross sections of, 6: 1818
 π^- mesons from, by photon reactions, 6: 321, 323, 671, 1005
 π^0 mesons from, by photon reactions, 6: 975
 π^0 mesons from, by proton reactions, 6: 670, 973
neutron reactions (n,p), 6: 361, 716
neutron total cross sections of, 6: 1525
nuclear magnetic moments of, 6: 995(J)
nuclear momentum distribution in, inferred from proton scattering, 6: 1841
photodisintegration cross section of, and angular distribution of photo-protons from, 6: 1020(J)
photodisintegration of, 6: 702, 1861
pickup process in, 6: 687
production by electrolysis of heavy water, 6: 828(J)
production of thermo-nuclear reaction in, by high current spark discharge, 6: 1867(J)
proton elastic scattering by, impulse approximation, 6: 1896(J)
proton scattering cross sections of, 6: 1887
proton spectra of, 6: 1821(R)
radiometric determination of, 6: 1628
reaction kinetics of, with U metal, 6: 573
scattering of neutrons by, theory, 6: 720(J)
theory of molecular, in magnetic fields, 6: 1828(J)
triton cross sections of, 6: 1528
- Deuterium compounds
vibration frequencies of, rules for, 6: 1417(J)
- Deuterium hydrides
reaction kinetics of, with U metal, 6: 573
- Deuterium-hydrogen systems
mass spectrographic analysis of, 6: 547
- Deuterium-water systems
exchange reactions in, γ -ray induced, 6: 556

- Deuteron scattering cross sections
theory of, 6: 1547
- Deuterons
effects on semiconductors, 6: 557(J)
inelastic scattering of, 6: 1888(J)
meson reactions (π^+ , $2p$), 6: 328(J), 329(J)
nuclear forces in, 6: 1346(J)
photodisintegration of, 6: 1013(J)
photodisintegration of, angular distribution of protons in, 6: 1539(J)
photodissociation of, by high energy γ -rays, 6: 1866
ranges in metals and semiconductors, 6: 1032(J)
reactions of, stripping theory of, 6: 1859
relativistic equation for ground state of, using scalar mesons and scalar coupling, 6: 1937(J)
relativistic pseudoscalar meson theory of, 6: 747(J)
response of scintillation crystals to, 6: 966(J)
scattering of, by hydrogen, 6: 717
- Dextran (labeled)
biosynthesis of, 6: 163, 568, 763
- Dextrins
from tapioca, nutritional value as a blood plasma substitute, 6: 1617
- Diabetes
glomerulosclerosis in, 6: 1074
- Diamonds
(See also Crystal detectors.)
correlation of counting properties with optical properties of, 6: 1294(J)
crystal structure and electric properties of, 6: 967(J)
thermodynamic properties of, 6: 1239(R)
- Dibenzanthracene
effects of radiation on chemical properties, 6: 1170(J)
- Diborane, amino-
molecular structure of, 6: 136
- Diborane, bromo-
molecular structure of, 6: 136
- Diborane, 1,1-dimethyl-
molecular structure of, 6: 136
- Diborane, dimethylamino-
molecular structure of, 6: 136
- Diborane, tetramethyl-
molecular structure of, 6: 136
- Dielectrics
(See also subheading dielectric properties under specific materials.)
current induced in, by electron bombardment, measurement of, 6: 1350(J)
- Differential thermal analysis
tungsten-molybdenum thermocouple for, 6: 1259(J)
- Diffusion
(See also as subheading under diffused materials and radiations.)
equation of, in binary alloys, 6: 1244(J)
through an interface, solution of equation for, 6: 800
mathematical analysis of, 6: 756, 953, 1442
meteorological aspects of, 6: 757, 979
- β -Diketones
chelation of Ba, Cu, and Ni compounds by, 6: 1634
dissociation constants in water-dioxane solutions, 6: 1633
- Dilatometers
development and operation of differential transformers for use as a sensitive element of, 6: 1780
- Dioxane
fluorescence of, α - or γ -induced, 6: 653(R)
- Disaccharides
ion exchange of, 6: 148
- Distillation apparatus
design for diffusion-pump oil, 6: 880(J)
- Dogs
radiosensitivity of, 6: 520(R)
- Dow Chemical Co.
progress reports, 6: 228(R), 903(R)
- Drosophila
autosomal lethals in, induced by x-radiation, 6: 8
barium and La metabolism in, 6: 503
copper metabolism in larvae of, 6: 1114
fluorescence in, as related genetically and biochemically to red eye pigment, 6: 767(J)
gynandromorphs in, induced by x radiation, 6: 773(J)
mutation of, induced by x radiation, 6: 770(J)
- Dry batteries
design of Zamboni type, 6: 1279(R), 1789(J)
- Dusts
(See also Aerosols.)
effects on turbulence of gas streams, 6: 189(J)
sampling equipment for, 6: 657(R)
- Dyes
(See also specific dyes, e.g., Toluidine blue; see also classes of dyes, e.g., Phenazine dyes and Thiazine dyes.)
in plastics, effects of radiation on electronic processes in, 6: 835(J)
- Dynamite Mine (Colorado)
uraniferous clays in, occurrence and analysis of, 6: 1458
- Dysprosium isotopes
alpha emission from, 6: 410
- Dysprosium isotopes Dy^{160}
internal conversion coefficients of, 6: 1555
isomers of, 6: 1555
- Dysprosium isotopes Dy^{165}
isomeric transition of, 6: 409
- Earth
age estimations of, 6: 922(J), 1755(J)
- Egg yolks
chromatographic analysis of normal and x-irradiated, 6: 508
- Eggs
effects of radiation on respiration and development of, 6: 1084
- Elastomers
fluorinated, preparation and evaluation of oil-resistant, for use at low temperature, 6: 1701(R)
physical and shielding properties of, 6: 442
- Electric arcs
(See also Gaseous ionization.)
control of electron current in, 6: 932(J)
design for crossed discharge, 6: 620
self-magnetic field in, 6: 1274(J)
theory of, 6: 1768
- Electric control systems
for use during irradiation, design of, 6: 1281(J)
- Electric currents
electronic device for measurement of small discharges, 6: 1577(P)
recording devices for, design of, 6: 1281(J)
- Electric fields
(See also Magnetic fields.)
effects on heat transfer in liquids, 6: 1203(J)
measurement in a linear accelerator, 6: 377
- Electric power
(Generation and transmission, excluding aspects normally associated with instruments.)
measurement for induction heating, 6: 1448(R)
- Electrochemical analysis
(See also as subheading under materials analyzed; see also Polarographic analysis.)
efficiency of micro-Hg cathode in, 6: 1648
- Electrochromatography
apparatus for separation of mixtures by, 6: 1135
- Electrodes
(See also headings by names of materials, e.g., Graphite electrodes.)
particle exchange between metallic, in high vacuum, 6: 1393(R)
- Electrodynamics
proceedings of the conference on dynamics of ionized media, University Coll., London, England, April 1951, 6: 1752
- Electromagnetic fields
theory, generalized to include case of self-energy not equal to zero, 6: 1366(J)
- Electromagnetic lenses
mathematical model of, 6: 454(J)
- Electrometers
(See also Electron tubes; Radiation detection instruments—ion current type.)
design of, 6: 1(R)
for pocket chambers, 6: 1581(P)
for small currents, 6: 282(J)
- Electron beams
energy in a linear accelerator, 6: 713
focusing of, 6: 476(P)
mathematical analysis of factors causing disturbances in, 6: 1770
molecular fission of hydrocarbons by, 6: 836(J)
scattering of, by foils, 6: 725(J)
- Electron-diffraction analysis
(See also as subheading under specific materials.)
bibliographies, 6: 1273(J)
measurement of electron diffraction intensities, 6: 108(R)
- Electron microscopes
revolving specimen stage for, 6: 1500
- Electron microscopy
danger of exposure to x rays from, 6: 783(J)
ultra-thin tissue sections for, 6: 766(J)

SUBJECT INDEX

Electron pairs

- calibration of nuclear emulsions using, from Be^8 γ rays, 6: 1807(J)
- detection and measurement of, 6: 655
- from deuteron bombardment of B^{10} , 6: 1009(J)
- formation of, 6: 1861
- formation of, by γ absorption in Pb and U, 6: 1543
- production of, by mesons, 6: 673(J)
- production of, by x radiation, 6: 402(J)

Electron scattering cross sections

- measurement of, by electron sensitive nuclear emulsions, 6: 1030

Electron tubes

- cold-cathode thyratrons, design of, 6: 1779
- frequency controller for, 6: 1785(J)
- for microwave generation, design of, 6: 1782(R)

Electrons

(For electrons from nuclear sources see also Beta particles; see also Positrons.)

- absorption of, by Pb, 6: 395(J)
- anomalous magnetic moment of, theory, 6: 1054(J)
- capture and loss of, by protons passing through air, 6: 1905(J)
- collision probability of slow, in gases, 6: 1490
- diamagnetism of free, 6: 1772(J)
- effects of scattering on bremsstrahlung in thin anticathodes, 6: 1890(J)
- effects of scattering on spatial distribution of x-ray bremsstrahlung, 6: 1889(J)
- effects on semiconductors, 6: 557(J)
- elastic scattering of, effect of finite size of nucleus, 6: 1904(J)
- emission of, due to γ rays, 6: 404(J)
- energy loss in a proportional counter, 6: 393(J)
- energy loss in thin layers, theory, 6: 1891(J)
- interactions (neutron), theory, 6: 1832(J)
- interactions of, 6: 681(J)
- interactions of, short-range, 6: 1861
- interactions with own radiation field, 6: 1365(J)
- ionization by, 6: 1263(J)
- multiple coulomb scattering of, in nuclear emulsions, 6: 1550(J)
- multiple scattering of, in nuclear emulsions, 6: 1293(J)
- multiple scattering of, theory, 6: 1902(J)
- path length of, in foils, 6: 725(J)
- polarization by polarized γ rays, 6: 1014(J)
- polymerization of organic compounds by, 6: 141(J)
- radiation from, in a magnetic field, 6: 918
- radiative correction to scattering of, by nuclei, 6: 1545
- range-energy relation in nuclear emulsions, 6: 1295(J)
- response of scintillation crystals to, 6: 966(J)
- scattering of, 6: 1818, 1821(R)
- scattering of, by A, 6: 401(J)
- scattering of, by Au and Be, 6: 1036(J)
- scattering of, by Ag, Al, Au, C, and Cu, 6: 1035(J)
- scattering of, by electrons, 6: 917
- scattering of, by electrons in nylon, 6: 1037(J)
- scattering of, by electrons in photographic emulsions, 6: 390
- scattering of, by hydrogen, theory, 6: 719(J)
- scattering of, in nuclear emulsions, 6: 661(J)
- scattering of radiation by, 6: 1034(J)
- simplified classical, theory, 6: 621(J)
- three-quantum annihilation of, 6: 1771
- trajectories of, in transgaussian region of elliptical electrostatic fields, 6: 283(J)

Electroplating

(See also subheadings plating and electroplating under base materials; also headings by materials of coating, e.g., Nickel coatings; see also Electrochemical analysis.)

- electronic control system for, 6: 1578(P)
- voltage regulator for control of, 6: 1777

Electrostatic analyzers

- focusing of, theory, 6: 280(J)

Electrostatic generators

- design of, 6: 1586(P), 1884(J)

Electrostatic lenses

- transgaussian region of elliptical, theory, 6: 283(J)

Electrostatic precipitators

- evaluation of, on a radiochemical process off-gas system, 6: 1092
- for monitoring fission gases, design of, 6: 482(P)

Electrostatic separation

- bibliographies, 6: 1423

Elementary particles

- classical model of, 6: 452(J)
- quantization of theory of spinning, 6: 1933(J)

Elements

- age estimations of, 6: 922(J)
- cytochemical analysis of, in biological samples, 6: 1101(J)

Elements (cont'd.)

- formation of, in universe, 6: 1754
- spectrographic determination of isotopic composition of, 6: 1573(P)
- Elephants
 - leukocyte count of, 6: 510(R)
- Embryonic tissues
 - radiosensitivity effects of suspensions of, 6: 783
- Enanthic acid, α -bromo-
 - polarographic behavior of, 6: 538
- Engineering Research Inst., Univ. of Michigan
 - progress reports, 6: 916(R)
- Enriched reactors
 - design of, 6: 1323
- Enzymes
 - (See also specific enzymes.)
 - effects of radiation on, 6: 916(R)
 - inactivation by oxidized fatty acids, 6: 1590
 - inactivation by radiation, 6: 40(J)
 - protective action of, against radiation injuries, 6: 23
- Equation of state
 - of gases at high temperatures, 6: 1773
- Erbium
 - spectrum of, isotope shifts in, 6: 1930(J)
- Erbium chlorides
 - activity coefficients in aqueous solutions, 6: 558
 - transference numbers of, 6: 563
- Erbium isotopes Er^{168}
 - internal-conversion coefficients of, 6: 1555
- Erythrocytes
 - effects of radiation on, direct and indirect, 6: 1598
 - effects of x radiation on, 6: 778(J)
 - potassium concentration in, effects of cholinesterase and choline acetylase inhibitors on, 6: 791
 - potassium exchange in, in sickle cell anemia, 6: 1388
 - potassium exchange in, rate of, 6: 793
- Escherichia coli
 - preparation of cell-free formic hydrogenlyase from, 6: 546
- Esters
 - ultraviolet spectra of, 6: 850
- Estrogens
 - radiosensitivity effects of, 6: 520(R), 763
- Ethane-d
 - preparation of, 6: 1628
- Ethane, 1,2-dibromo-
 - molecular vibrations of, and of its deuterated forms, 6: 137(J)
- Ethane, difluoro-
 - molecular dipole moments of, 6: 131(J)
- Ethane, diphenyl-
 - scintillations in, 6: 961
- Ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)-
 - effects of x radiation in, in alcoholic solution, 6: 1169(J)
- Ethanol
 - biosynthesis of, by Pseudomonas lindneri via a fermentative pathway, 6: 1619(J)
 - ionization potential of, by mass spectrography, 6: 291(J)
 - protective action of, against x radiation, 6: 1386(J)
 - proton resonances in, effects of temperature on, 6: 1671(J), 1672(J)
 - radiosensitivity effects of, 6: 46, 48
- Ether fires
 - control of, tests on, 6: 1394
- Ethers, chlorofluoralkyl
 - preparation of, 6: 465(P)
- Ethyl acetates
 - dissociation of, in G-M counter, 6: 312(J)
- Ethylene
 - hydrogenation of, catalytic, 6: 1637
 - molecular vibration of, and of its deuterated form, 6: 137(J)
- Ethylene (polymers)
 - as coatings for concretes, 6: 1724
- Ethylene, chloro-
 - quadrupole spectrum and crystal structure of solid, 6: 1673(J)
- Ethylene, chlorotrifluoro-
 - thermodynamic properties of, 6: 1159(J)
- Ethylene, chlorotrifluoro- (polymers)
 - melting points and polymer-solvent interaction of, 6: 1413(J)
 - solubilities of, 6: 1412(J)
 - thermal decomposition of, 6: 126
- Ethylene, tetrafluoro- (polymers)
 - thermal decomposition of, 6: 126
- Europium chlorides
 - activity coefficients of, in aqueous solutions, 6: 558
 - transference numbers of, 6: 563

- Europium complexes
polarographic analysis of, 6: 1651
- Europium isotopes
alpha emission from, 6: 410, 1556
decay schemes of, 6: 1907
electron spectra of, 6: 954(R)
- Eutectics
(See also specific eutectics; e.g., Potassium-sodium eutectics.)
formation of, 6: 119
- Extraction apparatus
continuous liquid-liquid extractor for solvents of various density, design of, 6: 1686
- Eyes
effects of radiation on, 6: 505
effects of x radiation on, in newborn mice, 6: 763
radiosensitivity of, 6: 506(R)
- Fast neutrons
detection of, by proton recoils, 6: 640(R)
detector for, in presence of radiation, 6: 641
dosage determinations of, in standard tissue, 6: 1508
effects in tissue, 6: 34
interactions of, with D and protons, 6: 716
measurement of flux of, methods for, 6: 1503
scattering of, 6: 296(R)
scattering of, by Al, Bi, Cr, Cu, Fe, Pb, Ni, and Ta, 6: 980
scattering of, by O^{18} , 6: 1895(J)
scattering of, by protons, 6: 729(J)
- Fatty acid complexes
with calcium and Sr, 6: 77
- Fatty acids
addition compounds of perfluoro, with ethers and tertiary amines, 6: 132(J)
carbon C^{14} distribution in, of liver, 6: 169(J)
determination of, by thiobarbituric acid, 6: 1590
effects of radiation on metabolism of, 6: 38
metabolism of, effect of heparin on, 6: 19(J), 497(R)
oxidation of, as affecting enzyme inactivation, 6: 1590
oxidation of, in rat tissues, 6: 792
- Fatty acids (labeled)
biosynthesis of, by liver slices, 6: 174(J)
- Ferriin
exchange reactions of, with ferroin, 6: 85, 572
- Ferritin
as an agent in vasodepression of blood vessels following irradiation, 6: 1600
- Ferroin
exchange reactions of, with ferriin, 6: 85, 572
- Fibrih
separation and S^{35} assay of, 6: 565
- Fibrinogen
effects of x-radiation on viscosity and ultracentrifugal behavior of, 6: 30
turnover rate of, in the dog, 6: 565
- Fibrinolysis
effects of radiation on, and effects on hemorrhage, 6: 510(R)
physiological effects, 6: 510(R)
- Field theory
(See also Quantum electrodynamics.), 6: 744(J)
bound interaction representation in, 6: 1362(J)
calculation of quantized boson fields, 6: 745(J)
covariant representation of the nuclear field, 6: 1306(J)
distinction between particles and antiparticles, 6: 1368(J)
equations of particles of arbitrary spin, 6: 1059(J)
impulse approximation in theory of scattering, 6: 1544
interactions of nucleons, mesons, and photons, 6: 1055(J)
interactions of spin- $\frac{1}{2}$ particles with a central pseudoscalar field, 6: 752(J)
interactions of spin-1 particles with meson fields, 6: 1061(J)
multipole solutions of meson fields, 6: 1369(J)
non-local quantization of, 6: 751(J)
particle scattering in meson fields, 6: 1042(J)
perturbation treatment of closed states in, 6: 456(J)
quantum theory of scattering, 6: 1039(J)
renormalizable, divergent integrals in, 6: 746(J)
scattering problems in, 6: 727(J)
space inversions for fields of spin $\frac{1}{2}$, 6: 1931
threshold for particle creation in quantum, 6: 1942(J)
- Filter materials
(See also specific filter materials, e.g., Asbestos; Filter papers, Glass wool; Sand; etc.)
effective fiber diameter of, 6: 517(J)
- Filtration
(See also under materials and processes.)
of aerosols, inertial mechanisms in, 6: 517(J)
- Fire extinguishing agents
testing of, for ether fires, 6: 1394
- Fish
size of, in White Oak Lake, 6: 11
- Fission
(See also subheadings fission and neutron fission cross sections under fissionable elements and isotopes; also subheading from fission under specific radiations; see also Chain reactions, Multiplication factor, Nuclear reactions.)
bibliographies, 6: 1529
distribution of nuclear charge in, 6: 1424(R)
new long period delayed neutrons from, 6: 1860
theory, 6: 1261
theory of activation energy of nuclear, 6: 1840
theory of number of fissions induced in fissile material by a uniform distribution of neutrons, 6: 1536
- Fission products
(See also isotopes of the specific elements produced by fission.)
activity analysis of, 6: 732(R)
charge of, as function of pressure of stopping gas, 6: 394(J)
distribution of activity in, 6: 731
maximum permissible limits of, in air, 6: 1611
metabolism of, in domestic animals, 6: 504(R)
neutron emission from, probability of, 6: 1424(R)
radioactive, industrial uses of, 6: 1706
radioactivity of, nomograms for calculating, 6: 406
yield curves of, 6: 1327(J), 1793
- Flotation
(See also as subheading under materials being separated.)
collector depressant equilibria in, 6: 890, 894
- Flotation reagents
(See also specific compounds used for flotation.)
tannic acid and quebracho as, 6: 890
- Flowmeters
(See also Air flow; Fluid flow; Liquid flow.)
for measurement of gas flow, design of, 6: 1185
- Fluid flow
(See also Convection (forced).)
bibliographies, 6: 1719(J)
dimensional analysis of, 6: 874(J)
in ducts with a uniformly distributed leakage, 6: 875(J)
equations of boundary layer near stagnation point, 6: 1716(J)
supersonic conical, at obstacle, equations for, 6: 1718(J)
- Fluid flow (laminar)
diffusion of gases in, 6: 1205
- Fluid flow (turbulent)
dynamics of suspended particulate matter in, 6: 184
- Fluid propellants
quantitative evaluation of, 6: 1438(J)
- Fluids
(See also Gases.)
activation of, by circulating through a neutron flux, 6: 1908
critical state of normal, 6: 1646(J)
2-Fluorenicarboxylic acid
preparation of, 6: 92
- Fluorescence
(See also Luminescence; Phosphorescence.)
chromatographic analysis for, in Drosophila, 6: 767(J)
exciton theory for, 6: 306(J)
in mutant of maize, 6: 774(J)
in phosphors exposed to α and γ rays, 6: 1392(R)
induced by α or γ rays, 6: 653(R)
- Fluoride complexes
equilibrium constants of, 6: 535
- Fluorides
(See also Fluorine compounds.)
exchange reactions with HF, 6: 125
- Fluorine
determination of, by measurement of nuclear magnetic resonance, 6: 1142(J)
electron affinity to, 6: 124, 555(J)
production of, using fluorine generator, 6: 1663
proton reactions (p, γ), 6: 1859
reaction of, with $KClO_3$, 6: 829(J)
reactivity of, with fluorocarbons, 6: 1662
spectrochemical determination of organically bound, application of hollow cathode source to, 6: 849

SUBJECT INDEX

- Fluorine chlorates
preparation of, 6: 829(J)
- Fluorine compounds
(See also Fluorides.)
infrared spectra of, 6: 1157(J)
- Fluorine generators
design and performance of, 6: 1663
- Fluorine isotopes
exchange of, between HF and interhalogen compounds, 6: 125
- Fluorine isotopes F^{17}
properties of energy states of, 6: 1859
- Fluorine isotopes F^{18}
formation of, by proton bombardment of Cu, 6: 700
- Fluorine isotopes F^{19}
deuteron reactions (d, α) and (d,p), 6: 1329(J)
energy levels of, 6: 1011(J)
nuclear magnetic moments of, 6: 995(J), 1307(J)
proton reactions (p,n), excitation functions for, 6: 1021(J)
radiometric analysis of, in gaseous fluorides, 6: 125
- Fluorine isotopes F^{20}
energy levels of, 6: 1329(J)
- Fluorocarbons
(Compounds containing only C and F; see also specific compounds.)
preparation of, with BiF_3 , 6: 1570(P)
production of, 6: 464(P)
stabilizing of, methods for, 6: 1662
thermodynamic properties of, 6: 127(J)
- Fluorocarbons (polymers)
fabrication of, by powder molding, 6: 461(P)
- Fluorohalocarbons
(Compounds containing only C, F, and other halogens; see also specific compounds.)
melting points and polymer-solvent interaction of, 6: 1413(J)
polymerization of, at high pressures, 6: 459(P)
solubilities of, 6: 1412(J)
- Fluorohydrocarbons
(Compounds containing only C, F, H; see also specific compounds.)
preparation of, with SbF_3 , 6: 1664(J)
- Fluoroorganic compounds
spectrochemical analysis of, application of hollow cathode source to, 6: 849
synthesis of, review of recent advances in, 6: 1157(J)
- Fluorophosphoric acid, diisopropyl ester
effects on concentration of K in erythrocytes, 6: 791
- Folic acid (labeled)
synthesis of, 6: 853(J)
- Food
preservation of, by irradiation, 6: 916(R)
- Formaldehyde
reactions of, with aldehydes containing one α -hydrogen, 6: 179(J)
- Formic acid
incorporation and retention of, in nucleic acids, 6: 566
isotopic effects in dehydration of, 6: 1122(J)
oxidation of, in irradiated solutions, 6: 556
- Formic hydrogenlyase
properties and preparation of, from *Escherichia coli*, 6: 546
- Fossils
comparison of, with similar Recent bones, 6: 764
- Francium isotopes
separation of, from proton-bombarded Th target, 6: 818
- Fructose
determination of, in fructose-6-phosphate and fructose-1-6-diphosphate, 6: 1399
- Fructose (labeled)
biosynthesis of, 6: 1700
- Fructose phosphates
analysis of, for fructose, 6: 1399
- Fuels
(See also fuels by name; e.g., Oils; see also Fluid propellants.)
effects of radiation on, 6: 916(R)
- Fungi
(See also Molds.)
effects of α -particles on mutations in, 6: 1085
effects of α -particles on spore germination and microthallus development of, 6: 1073
pathological effects on maize, 6: 499
synthesis of amino acids and carbohydrates by, 6: 759
- Furnaces
(Including devices using conduction, induction, radiation, etc. See also pertinent metallurgical subheadings under the material, e.g., casting and metallurgy. See also Resistance furnaces.)
Furnaces (cont'd.)
high-temperature, for use in nuclear reactors, design of, 6: 1316
for melting steel in vacuum, design of, 6: 246(J)
for sintering studies, design of, 6: 1449(R)
- Fused salts
electrolysis of, 6: 599(R)
phase studies of, methods used in, 6: 1398(J)
- Gadolinium
preparation of, by calcium reduction of chlorides, 6: 1171
- Gadolinium isotopes
alpha emission from, 6: 410, 1556
- Gadolinium isotopes Gd^{160}
binding energy of, calculation, 6: 333(J)
- Galena
flotation of, depressant action of tannic acid and quebracho in, 6: 890
flotation of, inorganic depressants for, 6: 894
- Gallium
chemistry, metabolism and toxicity of, a review, 6: 1106(J)
distribution coefficient of, in β , β' -dichlorodiethyl ether-HCl system, 6: 1424(R)
distribution of, in bones and tissues, 6: 494
dosage determinations and toxicology of, 6: 527
neutron resonance cross sections of, 6: 1304(R)
sources of, and recovery from flue dusts and germanite, 6: 1692(J)
- Gallium citrates
preparation of, 6: 494
- Gallium isotopes Ga^{67}
half-lives of, measured by differential ionization method, 6: 1357(J)
- Gallium isotopes Ga^{72}
diagnostic and therapeutic uses in bone malignancy, 6: 1106(J)
dosage determinations and physiological effects of, 6: 527
- Gamma absorption cross sections
measurement of, by photonuclear detector method, 6: 334
- Gamma cross sections
(See also subheading gamma reactions under specific elements and isotopes.)
measurement of, 6: 373(J)
methods of measurement of, 6: 963
theory of electrical dipole, 6: 1013(J)
- Gamma radiation
(See also X radiation.)
absorption of, 6: 1533
absorption of, in Pb and U, 6: 680(R), 1543
absorption of, in moist sand, 6: 296(R)
absorption of, for thickness measurements, 6: 937
accompanying K capture of Fe^{55} , 6: 434(J)
from americium Am^{241} , 6: 413
angular correlations of, from Cd^{111} , 6: 347(J), 417(J)
angular correlations of, in a cascade, 6: 339
angular distribution of, from polarized nuclei, 6: 1842(J)
angular distribution of secondary, from (n, γ) in reactor shields, 6: 1342
anisotropy of, from Co^{60} , 6: 997(J)
chemical effects on water, 6: 144(J), 1678
in cosmic radiation, 6: 612(J)
detection and measurement of, 6: 296(R), 313(J), 409, 650(R), 1802(R), 1907
detection of circularly polarized, 6: 1014(J)
detection of, with polyvinyl chloride films, 6: 660(J)
deuterons and protons produced by, on Cu, 6: 1532
diffusion of, through matter, 6: 382
dosage determinations of, in standard tissue, 6: 1508
drill-hole logging with, theory, 6: 1459
effects on biochemical oxidation of domestic sewage, 6: 1597
effects on enzymes, 6: 40(J)
effects on liquids, 6: 556
effects on organic liquids, measurement of, 6: 145(J)
from heavy nuclei, in relation to vibration-rotation spectra, theory, 6: 981(J)
histological effects of repeated low doses on mice, 6: 1806(J)
history of, 6: 712(J)
lethal dosage determinations for mice, 6: 506(R)
neutron and proton yields from, on Si and Mg, 6: 1874(J)
nuclear reactions and stars produced by, 6: 1861
pair production by, and detection of, 6: 655
pair production by, dependence on Z of, 6: 402(J)
polarization and angular correlation of, from Rh^{106} , Co^{60} , and Cs^{134} , 6: 430(J)
polarization of doubly scattered, 6: 1898(J)
from proton bombardment of Be^9 , 6: 405
reflection of, from quartz, 6: 444(R)

- Gamma radiation (cont'd.)
 scattering of, mathematical analysis, 6: 1285
 secondary electronic emission due to, 6: 404(J)
 statistical analysis of (γ, n) and (γ, p) reactions, 6: 1858
 theory of, 6: 983(J)
 transmission of, mathematical analysis, 6: 1285
- Gamma shielding
 design of, 6: 1360, 1582(P)
- Gamma sources
 preparation and industrial uses of, 6: 1552(R)
 uses of Rn, W^{187} , Th, and Ir^{192} as, 6: 446(R)
- Gamma spectra
 mathematical analysis, 6: 1285
 measurement of, with scintillation detectors, 6: 307(J)
 from proton bombardment of C, 6: 362
- Gamma spectrometers
 calibration of, 6: 444(R)
 design and performance of, 6: 647, 1803(J), 1861
 stability of, 6: 1802(R)
- Gas analyzers
 electronic, design of, 6: 576(J)
- Gas flow
 (See also Air flow.)
 analytical control of, apparatus for, 6: 462(P)
 kinetics of, 6: 624(J)
 mass flowmeters for measurement of, 6: 1185
 motion of solid particles in, 6: 188(J)
 in a porous medium, 6: 190(J)
 turbulence of, effect of dust concentration on, 6: 189(J)
- Gas flow (turbulent).
 density fluctuations and gravitational instability in, 6: 1276(J)
 density fluctuations in, 6: 1277(J)
 velocities in, frequency distributions of, 6: 331(J)
- Gaseous ionization
 (See also subheading ionization under gaseous materials.)
 effects of radiation on, 6: 916(R)
 proceedings of the conference on dynamics of ionized media, University
 Coll., London, England, April 1951, 6: 1752
 self-magnetic field in, 6: 1274(J)
 theory of, 6: 722(J)
- Gases
 (See also specific gaseous substances.)
 analysis of, bibliography, 6: 110
 analysis of, continuous, 6: 462(P)
 analysis of, with a vacuum gage, 6: 587(J)
 compressibility of, apparatus for measuring, 6: 187(J)
 cooling by, of a porous heat source, 6: 1197
 detection of impurities in, by mass spectrometer, 6: 1006
 detonation and ignition of, 6: 916(R)
 diffusion of, hydrodynamic equations for, 6: 622(J)
 equations of motion in viscous, 6: 624(J)
 ionization of, apparatus for measuring, 6: 650(R)
 liberation by laminarly flowing fluids, 6: 1205(J)
 performance of bare-wire thermocouples in air streams, 6: 1713
 radiological monitoring of, equipment for, 6: 482(P)
 thermal convection in, 6: 623(J)
 thermo-osmosis of, through membranes, 6: 1775(J), 1776(J)
 transport properties of, relationship between, 6: 1774
- Gastro-intestinal tract
 transit in, measurement of, 6: 13
- Geiger-Mueller tubes
 calibration of, with K^{40} , 6: 667(J)
 design of, 6: 755(J)
 discharge mechanism in A-filled, 6: 658(J)
 dissociation of ethyl acetate in, 6: 312(J)
 increasing counting efficiency of, by backscattering beta rays within the
 tube, 6: 1504
 maze-type, with fillings possessing low temperature coefficients,
 plateau changes in, 6: 1296(J)
 pulses from, under minimum load conditions using oscillographic
 techniques, 6: 1800
 slow discharge in nonself-quenching, 6: 310(J)
 xenon-ether-filled, properties of, 6: 1290(J)
- General Electric Research Lab.
 progress reports, 6: 1239(R), 1475(R)
- Genetics
 mutations and rate processes, theory, 6:
 radiation factors affecting, 6: 769(J), 773(J)
- Geological Survey
 progress reports, 6: 1454(R), 1455(R)
- Geology
 gamma logging, theory, 6: 1459
- George Peabody Claims
 torbernite occurrence at, 6: 214
- Germanium
 deuteron range-energy relation in, 6: 1032(J)
 effects of α bombardment of n-p-n junction in, 6: 1045(J)
 electric conductivity of, during neutron bombardment, 6: 1349(J)
 electron-hole production in, by α particles, 6: 1044(J)
 localized electronic states in bombarded, 6: 557(J)
 sources of, and recovery from flue dusts and germanite, 6: 1692(J)
 thermodynamic properties of, 6: 1641
- Germanium halides
 thermodynamic properties of, 6: 1641
- Germanium hydroxides
 solubility of, 6: 1641
- Germanium iodides
 thermodynamic properties and spectra of, 6: 1641
- Germanium oxides
 thermodynamic properties of, 6: 1641
- Glass
 (See also Borosilicate glass.)
 corrosion of, by H_2O_2 , 6: 240(J)
 surface tension of, methods of measuring, 6: 202
 wetting of metals by, 6: 201(R)
- Globulin
 electrophoretic determination of, in blood and urine, 6: 1074
- Glucose
 determination of poly-, in blood and urine, 6: 1652
 fermentation of, by *Leuconostoc mesenteroides*, 6: 165
 fluorimetric analysis of, 6: 1134
 metabolism of, by rat liver, 6: 758
 metabolism of, in x-irradiated yeast, 6: 510(R)
 uptake of C^{14} from, by amino acids in mouse brain, 6: 72(J)
- Glucose (labeled)
 synthesis of, 6: 1430
- Glucose phosphates
 exchange of P of, with inorganic phosphate, 6: 802
- Glutamic acid
 determination of, by N^{15} isotope dilution, 6: 819(J)
- Glutaric acid, α -oxo-
 conversion of, to malic acid in pigeon breast muscle, 6: 1620(J)
- Glyceric acid
 exchange of P of, with inorganic phosphate, 6: 802
 production of, in photosynthesis, 6: 167
- Glycerides
 synthesis of, 6: 1120
- Glycerophosphates
 effect on calcification of bone, 6: 21(J)
- Glycine, phthalyl-, ethyl ester (labeled)
 infrared spectra of, 6: 1696(J)
- Glycogen
 biosynthesis of, hormonal effect on, 6: 758
 storage in liver, effects of radiation on, 6: 56(J)
- Glycolic acid
 production of, in photosynthesis, 6: 167
- Glycolysis
 in mammary carcinomas, 6: 1091(J)
- Gold
 deuteron range-energy relation in, 6: 1032(J)
 electric conductivity of, effects of plastic deformation on, 6: 241(J)
 electron scattering by, 6: 1035(J), 1036(J)
 tissue distribution of, as effected by sub-total hepatectomy, 6: 1379(R)
 wettability of, by glasses, 6: 201(R)
- Gold-cadmium alloys
 phase studies of, 6: 1238(R)
 phase transformations and thermal expansion of, 6: 600(R)
- Gold-copper alloys
 ordering kinetics in, 6: 115
- Gold-iron alloys
 phase studies of, 6: 1467(R)
- Gold isotopes
 alpha emission from, 6: 410, 1556
 separation of, from deuteron-bombarded Pt and identification of, 6: 153
- Gold isotopes Au^{196}
 decay scheme of, 6: 1925(J)
- Gold isotopes Au^{197}
 decay schemes of, 6: 1925(J)
 gamma reactions (γ, γ) and (γ, n), 6: 365(J)
 nuclear electric moments of, 6: 996(J)
- Gold isotopes Au^{198}
 decay schemes of, 6: 435(J)
- Gold isotopes Au^{199}
 decay scheme of, 6: 1925(J)

SUBJECT INDEX

- Gold-nickel alloys
 - phase studies of, 6: 1467(R)
- Gold-silver alloys
 - diffusion in, 6: 603(R)
- Gold-silver couples
 - porosity of, metallographic studies, 6: 1474
- Gold single crystals
 - sintering of, 6: 603(R)
- Gonadotropic hormones
 - effects on biosynthesis of testosterone, 6: 173(J)
- Gonadotropins
 - effects of radiation and ultraviolet light on, 6: 772(J)
- Graphite
 - (See also Carbon.)
 - activation energy for flow of electric current in, 6: 1239(R)
 - adsorption of O on, as factor in combustion, 6: 1669(J)
 - analysis of, by pile oscillation method, 6: 697(J)
 - compression properties of, 6: 1721
 - corrosion of, by H_2O_2 , 6: 240(J)
 - crystal structure of, 6: 1161(J), 1162(J)
 - electric conductivity of, 6: 1260
 - electron distribution in, 6: 493(J)
 - lattice vibrations and specific heat of, 6: 1414
 - as reactor moderator, 6: 1315
 - self-diffusion in, theory, 6: 1152
- Graphite moderated reactors
 - design of, 6: 1323
- Grignard reagents
 - preparation of, 6: 92, 93
- Guanine (labeled)
 - synthesis of, 6: 569(J)
- Hafnium
 - chemical properties of, review, 6: 99(J)
 - determination of, by selenite method, 6: 1636
 - ion exchange properties of, 6: 1636
 - separation of, from Zr by ion exchange, 6: 844(J)
- Hafnium borohydrides
 - preparation of, 6: 467(P)
- Hafnium(IV) chloride complexes
 - thermal decomposition of, 6: 1636
- Hafnium chlorides
 - compounds with alkyl benzoates, heats of formation of, 6: 1396(J)
 - reactions of, with phosphorus oxyhalogens, 6: 1636
- Hafnium compounds
 - organic, preparation and properties of, 6: 1636
- Hafnium isotopes Hf^{175}
 - decay schemes of, 6: 1046
- Hafnium isotopes Hf^{179}
 - isomeric transition of, 6: 409
- Hafnium isotopes Hf^{181}
 - decay schemes of, 6: 650(R)
- Halohydrocarbons
 - (Compounds containing only C, H, and halogens; see also specific compounds.)
 - effects of x radiation on, in alcoholic solution, 6: 1169(J)
- Halogens
 - thermodynamic functions of, 6: 274
- Hanford Works
 - waste disposal at, 6: 1211
- Health physics
 - (Covering very general papers; specific aspects of Health Physics are indexed separately, e.g., Radiation protection; Radiation detection instruments; subheading biological effects under various radiations; subheadings metabolism and toxicology under various materials.)
 - lecture series on, 6: 781
 - standards of radiological protection and control, lecture on, 6: 1095
- Heat exchangers
 - (See also as subheading under processes using heat exchangers.)
 - design of, 6: 1202(J)
 - design, selection, and installation of, for aircraft, 6: 865
 - materials for, testing of, 6: 1723
- Heat-resisting alloys
 - (See also specific alloys concerned.)
 - creep properties of, effects of cold-work on, 6: 1207
 - fatigue of, at high temperatures, 6: 876
 - metallurgical and mechanical properties of, 6: 596
- Heat transfer
 - (See also under units and shapes; also the subheading thermal conductivity under materials; see also Boiling, Heat exchangers, and Thermal conductivity.)
 - Heat transfer (cont'd.)
 - by air flow in an inconel tube, theory, 6: 866
 - bibliographies on, 6: 1720(J)
 - effects of an electric field on, 6: 1203(J)
 - effects of surface boiling on, 6: 1443
 - equipment for testing, of liquid metals, 6: 186(R), 579
 - to and from flowing Hg, 6: 1199
 - by forced convection in Pt tubes, 6: 867
 - in infinitely long concentric cylinders, theory, 6: 869
 - by liquid metals in annuli and circular tubes, 6: 1198
 - from a porous heat source to a gas, theory, 6: 1197
 - reactor tube size for specified, 6: 1709
 - in reactors, lecture on, 6: 1201
 - Heavy water
 - (See Water-d₂.)
 - Heavy water reactors
 - (See also NRX reactor, and Zoe reactor.)
 - design of, lecture on, 6: 1323
 - design of low power, at Chalk River, 6: 1854
 - multiplication factor and neutron flux distribution of, 6: 1854
- Helium
 - (See also Alpha particles.)
 - absorption and scattering of π mesons in, 6: 1817
 - alpha scattering cross sections of, 6: 1033(J)
 - collision probability for low electrons in, 6: 1490
 - diffusion of, through Al, 6: 1745
 - disintegration of, by neutrons, 6: 1004
 - π meson scattering by, 6: 315
 - π mesons from, by photon reactions, 6: 324
 - permeation of, through stainless steel and inconel tubing, 6: 272
 - polarization and scattering of protons by, 6: 1887
 - proton scattering cross section of, 6: 1040(J)
- Helium ion beams (He^3)
 - acceleration of, by Cockcroft-Walton accelerator, 6: 1886(J)
 - reaction with He^3 nucleus, 6: 1535
- Helium isotopes
 - spectra of, isotope shifts in, 6: 743(J)
- Helium isotopes He^3
 - abundance of, in nature, 6: 1793
 - deuteron cross sections of, 6: 1859
 - photodisintegration cross sections of, calculations, 6: 1868(J)
 - reaction of, with He^3 , 6: 1535
- Helium isotopes He^4
 - deuteron cross sections of, 6: 1859
 - deuteron reactions (d,p), 6: 1869(J)
 - photodisintegration cross sections of, calculations, 6: 1868(J)
 - polarization of protons by scattering from, 6: 1900(J)
 - proton reactions (p,d), 6: 1821(R)
- Helium isotopes He^8
 - production of, in the Brookhaven reactor and Columbia cyclotron, 6: 1304(R)
- Hematite
 - absorption of dodecylamine acetate on, 6: 251(R)
- Hematopoietic system
 - effects of radiation from Ga^{72} on, 6: 527
 - effects of radiation on, 6: 33
- Hemolysis
 - caused by irradiation of erythrocytes, 6: 778(J)
- Hemorrhage
 - enzymatic factors in, 6: 510(R)
- Heparin
 - (See also the subheading antiheparin activity under specific materials.)
 - influence of, on lipoprotein metabolism, 6: 19(J), 497(R)
- Heptane
 - exchange of D for H in, 6: 122(J)
- Heptane, hexadecafluoro-
 - thermodynamic and optical properties, infrared and Raman spectra of, 6: 1158(J)
- Heptane-sulfur dioxide systems
 - diffusion in, 6: 537
- Heterocyclic compounds
 - molecular electric moments of, calculation, 6: 1695
- Hexane
 - chemical effects of α particles on, 6: 1421(J)
- 1-Hexanol
 - solubility of metallic nitrate hydrates in, 6: 83
- 1-Hexanol systems
 - phase studies of nickel(II) nitrate-, 6: 81
- Hexatriene, diphenyl-
 - fluorescence of, α - or γ -induced, 6: 653(R)

- Hexoses
(See also Sugars.)
ion exchange separation of, 6: 148
- High-temperature alloys
(See Heat resisting alloys.)
- Histamine
effects on distribution of Ca and I, 6: 529
- Holmium isotopes Ho^{165}
internal conversion coefficients of, 6: 1555
isomers of, upper limit to half life of, 6: 1555
- Horizons Inc.
progress reports, 6: 236(R), 1737(R)
- Hormones
(See also hormonal factors as subheading under organs, glands, and biological processes.)
deficiency of, carcinogenic effects, 6: 1080
physiological effects of, 6: 1080
secreted by I^{131} induced pituitary tumors, physiological effects of, 6: 1076
- Hyalite (uraniferous)
occurrence of, in Argentina, 6: 215(J)
- Hydrazyl, α, α -diphenyl- β -picryl-
paramagnetic resonance absorption of, 6: 1166
- Hydrocarbons
(See also specific compounds; see also Fluorohydrocarbons.)
chemical effects of α particles on, 6: 1421(J)
fluorination of, with BiF_3 , 6: 1570(P)
molecular fission of, by electron impact, 6: 836(J)
molecular structure of, relation to nuclear relaxation time, 6: 1418(J)
reflection of slow neutrons from liquid, 6: 1903(J)
- Hydrochloric acid
ionization of, in dioxane-water solutions, 6: 1631
- Hydrofluoric acid
exchange reactions of, with interhalogen compounds, 6: 125
- Hydrofluoric acid systems
redox reactions in, polarographic study of, 6: 552(R)
- Hydrogen
absorption of cosmic particles in, 6: 260(J)
collision probability for slow electrons in, 6: 1490
coherent neutron scattering amplitude of, 6: 1903(J)
compressibility isotherms and thermodynamic functions of mixtures of, with N_2 and NH_3 , 6: 1275(J)
determination of, bibliography on, 6: 110
deuteron cross sections of, 6: 1859
deuteron scattering by, 6: 1330(J)
deuteron scattering cross sections of, 6: 717
effects on stability of fluorocarbons, 6: 1662
energy spectra of protons scattered from, 6: 388, 1753
infrared spectra of, calculations, 6: 161(J)
isotopic exchange reaction of, with Li and Na borohydrides, 6: 1176
mass defect of, theory, 6: 1060(J)
mass of, 6: 349(J), 991(J)
mass of, by mass spectrography, 6: 1793
mass of, from nuclear reaction energies, 6: 992(J)
 π meson scattering by, 6: 315
 π meson scattering cross sections of, 6: 1818
 π^- meson scattering cross sections of, 6: 316
 π mesons from, by photon reactions, 6: 324
 π^0 mesons from, by photon reactions, 6: 317, 671
 π^+ mesons from, by photon reactions, 6: 669, 670
molecular vibration of, and of its deuterated forms, 6: 137(J)
multiple meson production in, by cosmic particles, 6: 267(J)
neutron coherent scattering amplitude of, 6: 1860
neutron and proton scattering cross sections of, 6: 1887
neutron reactions (n,p), 6: 716
neutron scattering cross sections of, 6: 729(J), 1340
neutron total cross sections of, 6: 1525
nuclear momentum distribution in, inferred from proton scattering, 6: 1841
proton range-energy relation in, effect of H_2 pressure on, 6: 1339
proton reactions of, in nuclear emulsions, 6: 611(J)
reaction kinetics of, with U metal, 6: 573
scattering of neutrons by, 6: 381, 715
theory of molecular, in magnetic fields, 6: 1828(J)
thermo-osmosis of, through rubber, 6: 1776(J)
- hydrogen-deuterium systems
mass spectrographic analysis of, 6: 547
- hydrogen halides
(See also specific compounds; e.g., Hydriodic acid.)
thermodynamic functions of, 6: 274
- Hydrogen ions
(See also Protons.)
response of scintillation crystals to, 6: 966(J)
- Hydrogen isotopes
effects on bonds in crystals, 6: 550(J)
mass spectrographic determination of, using U reduction, 6: 1792
- Hydrogen isotopes H^1
(See Hydrogen.)
- Hydrogen isotopes H^2
(See Deuterium.)
- Hydrogen isotopes H^3
(See Tritium.)
- Hydrogen-oxygen-steam systems
explosive limits of, 6: 273
- Hydrogen peroxides
corrosive effects and chemical stability of, 6: 240(J)
decomposition of by γ radiation, mechanism and rate constants of, 6: 1677
- Hydrogen sulfides-d
microwave spectrum and molecular properties of, 6: 1521
- Hydrogenation
(See also as subheading under specific materials.)
rate equations for catalytic, 6: 1637
- Hydrolysis
(See also as subheading under specific materials.)
heat of reaction and crystal energy in high-temperature, of solid trichlorides, 6: 1753
- Hydroxylamines, alkyl-
reaction with nitrous acid, 6: 1628
- Hyperfine structure
(See also subheading spectra under specific materials.)
modifications in, produced by electrodynamic effects, 6: 690(J)
nuclear magnetic moment measured by, anomaly in, 6: 1839
radiative corrections to, theory, 6: 451(J)
of solutions containing Mn^{++} ions, 6: 1312(J)
- Illinois Inst. of Tech.
progress reports, 6: 552(R)
- Illite
analysis of, 6: 1458
- Inconel
(See Nickel alloys.)
- Indium
diffusion of In and Tl in, near the melting point, 6: 895
x-ray spectra of, 6: 97(J)
- Indium complexes
equilibrium constants of, 6: 535
- Indium isotopes
isomeric transition of, 6: 409
- Indium isotopes In^{111}
decay schemes of, 6: 1352(J)
- Indium isotopes In^{114}
decay schemes of, 6: 650(R)
internal conversion in, 6: 1919(J)
- Indium isotopes In^{115}
chemical separation of isomeric, 6: 845(J)
- Indium-thallium alloys
phase studies of, 6: 1238(R)
- 3-Indoleacetic acid (labeled)
synthesis of, 6: 164, 568
- Infrared radiation
detection and measurement of, using temperature sensitive phosphors, 6: 1510
effects on x- and γ -ray induced chromosomal aberrations, 6: 27
- Institute of Engineering Research, Univ. of California, Berkeley
progress reports, 6: 201(R), 231(R)
- Instruments
(Common instruments are entered directly, e.g., Pressure gages and Voltmeters. See also various processes for pertinent instrumentation; see also Radiation detection instruments.)
development of, at the National Bureau of Standards, 6: 1497(R)
- Insulin
effects on P^{32} uptake by erythrocytes, 6: 790
- Intercoolers
for high-altitude cooling, 6: 1711
- Internal conversion
(See also Conversion electrons and Electrons—emission.)
in Ba^{137} , Cd^{110} , In^{114} , and Pr^{144} , 6: 1919(J)
calculation of final state of nuclei from coefficient of, 6: 1064(J)
measurement of, by scintillation pulse analysis, 6: 1499

SUBJECT INDEX

Internal conversion (cont'd.)

- in Tc^{99} , effect of chemical combination on, 6: 733, 734
- theory of, 6: 409

Intestine

- effects of radiation on, 6: 37
- effects of shielding of, on lethal effects of x-rays, 6: 1083
- systemic effects of irradiation of, 6: 35

Invar

(See Iron-nickel alloys.)

Invertase

- action of, on sucrose, 6: 1704(J)

Invertebrates

- effects of radiation on, 6: 1381(J)

Iodates

- solubility of, influence of mixed solvents on, 6: 100(J)

Iodine

- diagnostic and therapeutic uses of, 6: 523(J)
- effects of, in radiolysis of hydrocarbons, 6: 1674
- spectra of, effects of oxygenated solvents on, 6: 1694
- tissue distribution of, during histamine shock, 6: 529
- tissue distribution of, in larvae, 6: 111
- uptake of, by thyroid gland, 6: 496(R)

Iodine isotopes I^{124}

- forbidden β^+ spectra of, 6: 1914(J)

Iodine isotopes I^{128}

- decay of, β - γ angular correlations in, 6: 1843(J)

Iodine isotopes I^{127}

- quadrupole resonance frequency of, in crystalline covalent compounds, 6: 343(J)

Iodine isotopes I^{129}

- nuclear properties of, 6: 1928

Iodine isotopes I^{131}

- beta and γ spectra of, 6: 422(J)
- concentration of, in hospital wastes, 6: 519(J)
- contamination of metal surfaces by, in solution, 6: 883
- decay schemes of, 6: 436(J), 1371, 1922(J)
- disintegration of, 6: 420(J)
- dosage determinations of, in thyroid glands, 6: 67(J)
- gamma emission of, 6: 1511
- histological and pathological effects on thyroid gland, 6: 1604(J)
- neoplasms of the pituitary induced by, 6: 776(J)
- occurrence of acne and gynecomastia after administration of, in hyperthyroid therapy, 6: 1087(J)
- physiological effects and tissue distribution of therapeutic doses, 6: 1104(J)
- pituitary tumors produced by, 6: 1080
- production of, from pile-irradiated Te, 6: 151
- removal of, from water supplies, 6: 515
- in treatment of thyroid carcinoma, 6: 68(J)

Ion beams

- (See also headings for beams identified by particles, e.g., Neutron beams; Molecular beams; etc.; see also Accelerators; Ion sources.)
- double focusing of, with small magnetic lenses, 6: 1794
- focusing of, 6: 296(R), 476(P)
- neutralization of space charge in positive, 6: 636(J)

Ion exchange

- (Theoretical reports on equilibria, etc.; see also as subheading under specific materials; see also Adsorption.)
- rare-earth separation by, theory, 6: 1690(J)

Ion exchange materials

- (See also specific materials, e.g., Resins; Zeolites, etc.; see also Anion exchanging compounds.)
- suitability of, for electrophoretic separations, 6: 1424(R)

Ion sources

- (Covering ions from nonradioactive sources; for radioactive sources see headings identified by emitted radiation, e.g., Alpha sources; see also instruments having an ion source component, e.g., Accelerators; Mass spectrometers, etc.)

- design of, 6: 1549
- for H^+ and He^+ ions, 6: 1886(J)
- for mass spectrometers, 6: 972(J), 1574(P), 1580(P)
- for negative ions, 6: 290(J)
- operation of, 6: 481(P)

Ionization chambers

- boron trifluoride for, 6: 639
- calibration of, 6: 682(J)
- calibration of 4π high pressure, 6: 643
- for C^{14} measurement, 6: 654
- for comparing nuclear reactions, 6: 1576(P)
- for continuous x-ray monitoring, 6: 958
- cosmic-ray intensity measurement with, 6: 928(J)

Ionization chambers (cont'd.)

- design of, 6: 296(R), 640(R), 956
- design, calibration, and performance of, at RCA, 6: 638(R), 650(R), 651(R), 652(R)
- determination of electrical depth of, 6: 300(J)
- for radiotherapy, 6: 668(J)
- for thermal neutron flux measurement, 6: 666(J)

Ionization potentials

- determination of, by mass spectrography, 6: 291(J)
- determination of, monoenergetic electron source for, 6: 1263(J)

Ions

(See also heading for ions by name, e.g., Uranium(IV) ions; see also Anions; Recoil ions.)

- acceleration of, 6: 481(P)
- polarizability of, in eutectic mixtures, 6: 119

Iridium

- tissue distribution of, in rats, 6: 496(R)

Iridium isotopes Ir^{192}

- decay schemes of, 6: 444(R)
- gamma radiation following decay of, 6: 1861
- gamma spectra of, 6: 446(R)
- half lives of, 6: 1912(J)
- internal conversion and isomeric transition of, 6: 409

Iron

(See also Steel.)

- absorption of cosmic photons in, 6: 258(J)
- analysis of, for S and O by H reduction, 6: 1658(R)
- corrosion of, by Bi-Pb eutectic, 6: 901
- corrosion of, by H_2O_2 , 6: 240(J)
- corrosion of, by liquid Bi, 6: 900
- gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538
- infrared spectra of, calculations, 6: 161(J)
- ion exchange studies of, 6: 1628
- neutron cross sections of, 6: 1526
- neutron diffraction pattern for, 6: 1038(J)
- neutron scattering cross sections, 6: 493(J)
- permeability of, by gas, 6: 1232(R)
- physical properties of porous, 6: 1231(R)
- preparation of porous, 6: 1231(R)
- scattering of neutrons by, 6: 980
- spallation products of proton-bombarded, 6: 1862
- spectrographic determination of, in organic solids, 6: 158
- spectrophotometric determination of traces, in Zr using tiron, 6: 1656

Iron alloys

- corrosion of, by H_2O_2 , 6: 240(J)

Iron-cerium alloys

- constitution diagrams of, 6: 912(J)

Iron-chromium alloys

- corrosion of, by liquid Bi, 6: 900

Iron-chromium-cobalt-nickel alloys

- creep properties of, effects of coldwork on, 6: 1207

Iron-cobalt alloys

- recrystallization of, effects of magnetic field on, 6: 601(R)

Iron complexes

- equilibrium constants of, 6: 535

Iron(II) fluorides

- neutron diffraction analysis of, 6: 1548

Iron-gold alloys

- phase studies of, 6: 1467(R)

Iron ions

- exchange reactions between, in aqueous solution, 6: 1182
- inhibition of Ti corrosion by, 6: 588

Iron(II) ions

- electron transfer exchange reactions of, with Fe(III) ions, 6: 85, 572

Iron(III) ions

- electron transfer exchange reactions of, with Fe(II) ions, 6: 85, 572
- spectrophotometric determination of, in HCl, 6: 1393(R)

Iron isotopes

- yield of, in high energy nuclear reactions, 6: 1628

Iron isotopes Fe^{52}

- decay schemes of, 6: 1628

Iron isotopes Fe^{53}

- beta spectra and half lives of, 6: 735

Iron isotopes Fe^{54}

- binding energy of, 6: 989(J)
- gamma reactions (γ, n), 6: 1871(J)

Iron isotopes Fe^{55}

- formation of, by neutron or deuteron reactions, 6: 1790
- gamma emission from, accompanying K capture, 6: 434(J)
- gamma spectra, 6: 1923(J)
- mass of, compared to Mn^{55} , 6: 434(J)

- Iron isotopes Fe^{56}
 binding energy of, 6: 333(J), 989(J)
 excited states of, from the Mn^{55} (p,n) reaction, 6: 1877(J)
- Iron isotopes Fe^{59}
 formation of, 6: 496(R)
 half lives of, measured by differential ionization method, 6: 1357(J)
 production and purification of, from Co^{59} (d,2p), 6: 1790
- Iron-magnesium alloys
 corrosion of, effect of composition and heat treatment on, 6: 228(R)
- Iron-magnesium phosphorus alloys
 corrosion of, effect of composition and heat treatment on, 6: 228(R)
- Iron-nickel alloys
 phase transformations in, 6: 600(R)
 powder metallurgy and physical properties of porous, 6: 1233(R)
 strains in, caused by martensitic transformation, 6: 594
 surface tension of, effect of composition on, 6: 205
- Iron-nickel-tantalum alloys
 composition and physical properties of, 6: 909(J)
- Iron perchlorates
 corrosive effects on Ag, 6: 889, 1468
- Iron-silicon alloys
 crystal structure of, 6: 1155
- Iron sulfates
 corrosive effects on Ag, 6: 1468
 oxidation of, in irradiated solutions, 6: 556
 oxidation of, by x radiation, 6: 146(J)
- Iron-titanium alloys
 surface tension of, 6: 1449(R)
- Iron-uranium alloys
 magnetic susceptibility of, 6: 1433
- Irradiation techniques
 (See also subheading biological effects etc., under specific radiations;
 also subheading effects of radiation under specific materials, various
 animals, etc.; see also Radiation target cans; Radiotherapy.)
 for producing γ -n and γ -p activities in betatrons, 6: 279(J)
- Isotope separation methods
 (See also subheading preparation, etc., under the isotopes of the
 elements.)
 lecture on, 6: 1282
 ultrasonic radiation, 6: 286
- Isotopes
 (See also specific isotopes; see also Radioisotopes; Stable isotopes;
Tracer techniques.)
 abundance of, in universe, 6: 1754
 electromagnetically enriched, inventory of, 6: 285
 isomeric transitions of, 6: 335
 relative abundance of, spectrographic determination, 6: 1573(P)
- Jeep reactor
 (Norwegian)
 design of, 6: 1855
 pictures of, 6: 1002(J)
- Jet Propulsion Lab., Calif. Inst. of Tech.
 progress reports, 6: 1164(R), 1230(R), 1231(R), 1232(R), 1233(R)
- Jets
 drop formation, 6: 183
- Johns Hopkins Univ.
 progress reports, 6: 789(R)
- K-capture
 (See the subheading electron capture under specific materials.)
- KAPL intermediate power breeder
 gas seals for control rods of, design and testing, 6: 1707
- Keratins
 effects of radiation on, 6: 493(J)
- Ketene
 microwave spectra of, 6: 548
- Ketones
 (See also Diketones.)
 fluorination of, 6: 91(R)
- Klystrons
 (See Electron tubes.)
- Knolls Atomic Power Lab.
 (See also KAPL)
 progress reports on waste disposal, 6: 882(R)
- Krypton
 collision probability for slow electrons in, 6: 1490
 fluorescence of, 6: 409
 neutron scattering cross sections of, 6: 679
- Krypton isotopes
 radioactivity of, from fission, 6: 1839
- Krypton isotopes Kr^{83}
 angular correlation between electron and neutrino in decay of, 6: 1909
- L-capture
 (See the subheading electron capture under specific materials.)
- Laboratories
 (Design and construction; e.g., ventilation (including hood exhausts),
 heating, lighting, waste disposal, construction materials and services,
 etc.)
 animal, design and air conditioning for, 6: 1373
 research, space requirements for, 6: 1416
 Laboratory for Nuclear Science and Engineering, Mass. Inst. of Tech.
 progress reports, 6: 296(R), 407(R), 1483(R)
- Lactates
 metabolism of, in tumor and spleen cells, 6: 171(J)
- Lactic acid
 biosynthesis of, by fungus, 6: 532(J)
- Lanthanum
 fractional-precipitation separation of, from Ce and Pr, 6: 1174(J)
 ion exchange with U in uranyl nitrate, 6: 76
 tissue distribution of, in *Drosophila* larvae, 6: 1595
 uptake and distribution of, in *Drosophila*, 6: 503
- Lanthanum chlorides
 activity coefficients, conductances, and transference numbers of, 6: 558,
 562, 563
 high-temperature hydrolysis and crystal energy of, 6: 1753
- Lanthanum complexes
 dissociation of, in aqueous solutions, 6: 564(J)
- Lanthanum ferricyanides
 electrolytic dissociation of, 6: 841(J)
- Lanthanum isotopes La^{138}
 decay schemes of, 6: 1916(J)
- Lanthanum isotopes La^{140}
 decay schemes, coincidence studies of, 6: 1917(J)
 gamma spectra and decay scheme of, 6: 307(J)
 preparation of carrier-free, 6: 1422
- Lanthanum nitrates
 distribution of, between water and 1-hexanol, 6: 102
- Lanthanum oxides
 heat content, specific heat, and entropy of, 6: 147(J)
- Larvae
 iodine distribution in tissues of, 6: 111
- Lauric acid
 incorporation of, into phospholipides by rats, 6: 798(J)
- Lauric acid, cholesteryl ester
 synthesis of, 6: 852
- Lead
 absorption of β particles by, 6: 395(J)
 absorption of cosmic electrons by, 6: 262(J)
 absorption of cosmic photons by, 6: 258(J)
 absorption of γ radiation by, 6: 680(R), 1533, 1543
 abundance of, in meteorites, 6: 1754
 alpha reactions of, 6: 412
 corrosion of, by H_2O_2 , 6: 240(J)
 dynamic coefficients of, 6: 245(J)
 electrolytic separation and determination of, 6: 1138(J)
 electrolytic separation from V, 6: 90(R)
 formation of V^3 particles by bremsstrahlung on, 6: 1872(J)
 gamma reactions (γ ,n) at 320 and 160 Mev, 6: 1538
 isomeric activity produced in, by neutrons, 6: 432(J)
 meson scattering cross sections, 6: 319, 978(J)
 π^- meson scattering cross sections, 6: 319
 π^0 mesons from, by photon reactions, 6: 317
 neutrons produced by μ mesons in, 6: 1759(J)
 penetrating showers produced in, by cosmic radiation, 6: 266(J)
 polarographic determination of, 6: 1163
 scattering of neutrons by, 6: 980
- Lead acetates
 isotopic exchange reactions of, 6: 1626
- Lead-bismuth eutectic
 corrosive effects on metals and alloys, 6: 901
 heat-transfer characteristics of, under forced convection, 6: 1712
- Lead isotopes
 primeval abundances of, and age of earth's crust, 6: 1755(J)
- Lead isotopes Pb^{208}
 half life of isomeric state of, 6: 1839
- Lead isotopes Pb^{207}
 gamma emission of, accompanying Bi^{207} decay, 6: 1915(J)

SUBJECT INDEX

- Lead isotopes Pb^{209}
 - mass, determination of, 6: 1283
- Lead isotopes Pb^{210}
 - beta spectra of, 6: 418(J)
 - electron spectra of, 6: 954(R)
 - spectra of, 6: 1304(R)
- Lead isotopes Pb^{212}
 - internal conversion lines of, 6: 995(J)
- Lead nitrates
 - fluorescent screen of CdI_2 mixed with, 6: 301(J)
 - self-absorption and self-scattering of β particles by, 6: 1344
- Lead-tin alloys
 - dynamic coefficients of, 6: 245(J)
- Lead-titanium couples
 - corrosion of, by synthetic ocean water, 6: 1236
- Leak detectors
 - (See also the subheadings instrumentation and monitoring under reactors and specific processes.)
 - cold cathode mass spectrometer, 6: 584(J)
 - design of, based on optical absorption in Schumann region, 6: 879(J)
 - review of, 6: 583(J)
- Leaves
 - chlorophyll in, 6: 159
- Leukemia
 - induction and prevention of, review, 6: 20(J)
- Light
 - (Covering material in which the wavelength is not specified. See also headings prefixed by Photo-. See also Infrared radiation; Quantum mechanics; Scintillation detectors; Ultraviolet radiation.)
 - effects on photographic film, 6: 1881(J)
- Lignites
 - fluorimetric analysis of, for U, 6: 1136
- Linear accelerators
 - (For belt-type electrostatic generators see also Van de Graaff accelerators.)
 - design and operation of, at MIT, 6: 1541
 - electron production in, 6: 1338(J)
 - field strength in, determination of, 6: 377
 - heavy beam loading effects in, 6: 1337(J)
 - operation of, 6: 1821(R)
 - particle dynamics in, 6: 713
 - for protons, design, 6: 1026(J)
- Linoleic acid
 - decarboxylation and reconstitution of, 6: 1702
 - oxidation of, as affecting enzyme inactivation, 6: 1590
- Linoleic acid (labeled)
 - synthesis of, 6: 1702
- Liquid flow
 - (See also Fluid flow.)
 - measurement of, in spherical containers, 6: 1440, 1441(R)
- Liquids
 - coherent scattering processes in, theory of, 6: 726(J)
 - energy absorption by externally irradiated, 6: 1343
 - heat transfer in, 6: 1203(J)
- Lithium
 - chromatographic separation of, from Na, 6: 848(J)
 - distribution between plasma and corpuscles in blood, 6: 18(J)
 - electronic energy levels of, in lithium hydride, 6: 1303(J)
 - gravimetric determination of small quantities of, 6: 821(J)
 - heat of solution of, in liquid NH_3 , 6: 1121(J)
 - in human blood, quantity of, 6: 17(J)
 - π^0 mesons from, by photon reactions, 6: 317
 - origin of, in cosmic radiation, 6: 1754
 - polarographic determination of, in silicates, 6: 820(J)
 - proton reactions (p,n), 6: 1859
 - refining by distillation, effect of pressure on, 6: 1251(J)
 - review of production, properties, and uses of, 6: 914(J)
 - spectrographic analysis of, 6: 1145(J)
- Lithium amide
 - crystal structure of, 6: 1661(J)
- Lithium borates
 - coloration of, 6: 142(J)
 - cryoscopy in molten, 6: 541(J)
- Lithium borohydrides
 - exchange reactions of, with H gas, 6: 1176
- Lithium chlorides
 - ionization of, 6: 541(J)
- Lithium compounds
 - bibliographies on use of organic, in organic synthesis, 6: 166
- Lithium hydrides
 - electronic energy of, quantum mechanical study, 6: 1303(J)
- Lithium imide
 - preparation and crystal structure of, 6: 1643(J)
- Lithium iodide crystals
 - activation of, by Tl, In, Sn, and Ag, 6: 1507
- Lithium iodides
 - scintillation and luminescence of, effect of temperature on, 6: 302(J)
- Lithium isotopes Li^6
 - inversion of doublet in compound nucleus of, from p- He^4 scattering, 6: 1900(J)
- Lithium isotopes Li^7
 - from Be^9 (p, α), 6: 1016(J)
 - deuteron reactions (d, α) and (d,p), 6: 710(J)
 - deuteron reactions (d,p) Li^{7*} (γ), angular correlations in, 6: 352(J)
 - disintegration of, in nuclear emulsions, 6: 644
 - electrolytic separation of, from molten $LiNO_3$, 6: 946
 - energy levels of, 6: 338, 405, 1859
 - preparation of targets of, 6: 536
 - range-energy curves for, in nuclear emulsions, 6: 397(J)
- Lithium isotopes Li^7
 - neutron capture cross section of, extra-nuclear contribution to, 6: 1873(J)
 - nuclear energy levels of, 6: 1880(J)
 - nuclear magnetic moments of, 6: 995(J)
 - nuclear spin of excited state and isomeric transition of, 6: 352(J)
 - proton reactions of, 6: 985
 - proton reactions (p, α), 6: 711(J)
 - proton reactions (p,n), excitation functions for, 6: 1021(J)
 - proton reactions (p,p'), γ spectrum from, 6: 1918(J)
 - range-energy curves for, in nuclear emulsions, 6: 397(J)
 - triton absorption cross section of, 6: 1859
- Lithium isotopes Li^8
 - cross section for formation of, by Li^7 (n, γ), 6: 1873(J)
 - range-energy curves for, in nuclear emulsions, 6: 397(J)
- Litter sizes
 - effects of radiation on rabbit, 6: 504(R)
- Little Mac Claims
 - torbernite occurrence at, 6: 214
- Liver
 - carbohydrate metabolism in, 6: 758
 - carbon C^{14} distribution in fatty acids of, 6: 169(J)
 - effects of sub-total hepatectomy on response to colloidal Au^{198} injection, 6: 1379(R)
 - metabolism in, effects of radiation on, 6: 56(J), 506(R), 1383(J)
- Lode deposits
 - exploration of, in Morocco, 6: 1460(J)
 - exploration of, for U in Grant Co., New Mexico, 6: 1457
- Lode deposits (uraniferous)
 - prospecting of, in Larimer Co., Colorado, 6: 1456
- Los Alamos Fast Reactor
 - gamma spectra of, 6: 998
- Los Alamos Water Boiler
 - design and operating characteristics of, 6: 999
 - design of Supo, 6: 1852
 - gamma spectra of, 6: 998
- Louisville Univ.
 - progress reports, 6: 1177(R)
- Luminescence
 - (See also as subheading under specific materials. See also Fluorescence; Phosphorescence.)
 - decay of, of LiI , NaI , KI , $NaI(Tl)$, and $KI(Tl)$, 6: 302(J)
 - in firefly extracts, 6: 1134
 - potentiometric measurement of, in isolated spinach and mustard chloroplasts, 6: 1601(J)
- Lutetium isotopes Lu^{175}
 - gamma emission and K/L conversion electron ratios, 6: 1046
- Lutetium isotopes Lu^{176}
 - nuclear magnetic moment of, and comparison with nuclear shell model, 6: 342(J)
- Lymph
 - effects of x radiation on cellular composition of, 6: 1599
- Lymph volume
 - determination of, 6: 1117(J)
 - determination of, using I^{131} -labeled albumin, 6: 25
- Lymphocytes
 - effects of, in treatment of radiation injuries, 6: 1612
- Lysozyme
 - effects of ACTH on, 6: 9
- M-capture
 - (See the subheading electron capture under specific materials.)
- MacGregor Claims (Colorado)
 - torbernite occurrence at, 6: 214

- Magnesium**
 cathodic sputtering of, 6: 252
 corrosion of commercially pure and high purity, 6: 228(R)
 determination of, in Na metal, 6: 815
 electric conductivity of, change on melting, 6: 1264(J)
 heat of combustion of, 6: 1131(J)
 infrared spectra of, 6: 161(J)
 solubility of, in Cd, 6: 235(R)
 spectrographic determination of, 6: 1144(J)
 spectrographic determination of, in organic solids, 6: 158
- Magnesium (liquid)**
 electric conductivity of, 6: 1264(J)
- Magnesium alloys**
 bibliographies on, 6: 904
- Magnesium-aluminum alloys**
 corrosion mechanism of, 6: 248(J)
 reaction with steam, 6: 1257(J)
 stress-corrosion mechanism in, 6: 1219(J)
 stretcher-strain markings in, 6: 1252(J)
- Magnesium-aluminum-copper alloys**
 aging of, x-ray-diffraction study, 6: 244(J)
 constitution diagrams of, 6: 243(J)
- Magnesium-aluminum-silicon alloys**
 grain refinement of, effect of various additions, 6: 250(J)
- Magnesium-aluminum-zinc alloys**
 corrosion mechanism of, 6: 248(J)
- Magnesium-cadmium alloys**
 entropy and specific heat of, 6: 1472(R)
 heats of formation of, 6: 1480(J)
 thermodynamic properties of, 6: 1479(J)
- Magnesium complexes**
 dissociation of, in aqueous solutions, 6: 564(J)
 equilibrium constants of, 6: 535
 with 2-methyl-8-quinolinol, stability of, 6: 1141(J)
- Magnesium-iron alloys**
 corrosion of, effect of composition and heat treatment, 6: 228(R)
- Magnesium-iron-phosphorus alloys**
 corrosion of, effect of composition and heat treatment, 6: 228(R)
- Magnesium isotopes**
 relative yields from γ reactions (γ, n) and (γ, p) on, 6: 1874(J)
- Magnesium isotopes Mg^{23}**
 beta spectra and half lives of, 6: 735
- Magnesium isotopes Mg^{24}**
 gamma reactions (γ, n), 6: 1874(J), 1876(J)
 inelastic scattering of deuterons by, 6: 1888(J)
 proton reactions (p, n), 6: 737
- Magnesium isotopes Mg^{25}**
 deuteron reactions (d, α) and (d, p), 6: 1533
 gamma reactions (γ, p), 6: 1874(J), 1876(J)
 proton reactions (p, n), excitation functions for, 6: 1021(J)
- Magnesium isotopes Mg^{26}**
 deuteron reactions (d, p), 6: 1533
 gamma reactions (γ, p), 6: 1874(J), 1876(J)
 proton reactions (p, n), excitation functions for, 6: 1021(J)
- Magnesium nitrates**
 distribution of, between water and 1-hexanol, 6: 102
- Magnesium oxides**
 recrystallization and sintering mechanism of, 6: 117
 thermal conductivity of, 6: 204
- Magnesium sulfates**
 electrolytic dissociation of, 6: 841(J)
- Magnesium-thorium-zirconium alloys**
 metallurgical properties of, 6: 903(R)
- Magnesium-uranium alloys**
 metallography of, with polarized light, 6: 1228
- Magnesium-zirconium alloys**
 constitution diagrams of, 6: 591(R)
- Magnetic fields**
 (Including magnetic lenses, flux measurements, etc.; see also as sub-heading under the specific device; see also Electric fields.)
 circuit for stabilization of, for the Louvain cyclotron (Belgium), 6: 1542(J)
 correction of magnetic lenses in beta spectrometry, 6: 281(J)
 focusing of charged particles with, 6: 450(J)
 influence of, on angular correlation of emitted particles, 6: 346(J)
 magneto-hydrodynamic effects on thermal convection, 6: 1715(J)
 theory of H_2 and D_2 in, 6: 1828(J)
 vacuum polarization of, 6: 1365(J)
- Magnetic moments**
 (See also subheadings for nuclear, atomic, and molecular magnetic moments under specific materials.)
 Magnetic moments (cont'd.)
 measurement of, applied to chemical analysis, 6: 1142(J)
 theory of, of a nucleon, 6: 684(J)
- Magnetic susceptibility**
 methods of measurement of, 6: 1433
- Magnetite**
 neutron diffraction analysis of, 6: 1038(J)
 recovery of V from titaniferous, 6: 911(J)
- Magnetrons**
 (See Electron tubes.)
- Maize**
 (Indian corn; Zea mays)
 mutations in plants from irradiated seed of, 6: 774(J)
 response of, to inoculation with *Ustilago zeae*, 6: 499
 sterility in, involving gene-cytoplasm interaction, 6: 2
- Malic acid**
 biosynthesis of, by conversion of α -ketoglutaric-1,2- C_2^{14} acid in pigeon breast muscle, 6: 1620(J)
- Malonic acid (labeled)**
 decarboxylation of, C^{14} isotope effect in, 6: 831
- Malonic acid, esters**
 hydrolysis of, carbonate cleavage in, 6: 817
- Malononitrile**
 radiosensitivity effects of, 6: 51(J)
- Manganese**
 neutron resonance cross sections of, 6: 1304(R)
 neutron scattering cross sections of, 6: 1304(R)
 paramagnetic resonance absorption in solutions containing, 6: 1312(J)
- Manganese alloys**
 sigma phase in, 6: 1246(J)
- Manganese-chromium alloys**
 phase studies of, 6: 1259(J)
- Manganese compounds**
 hyperfine structure of, 6: 1312(J)
 paramagnetic resonance and hfs of divalent, 6: 1847(J)
- Manganese(II) fluorides**
 neutron diffraction analysis of, 6: 1548
- Manganese isotopes Mn^{53}**
 from $Cr^{53}(p, n)$, energy levels of, 6: 359
- Manganese isotopes Mn^{54}**
 from $Cr^{54}(p, n)$, energy levels of, 6: 359
- Manganese isotopes Mn^{55}**
 mass of, compared to Fe^{55} , 6: 434(J)
 proton reactions (p, n), 6: 407(R), 1877
- Manganese-titanium alloys**
 phase studies of, 6: 1732
- Manganese-uranium alloys**
 magnetic susceptibility of, 6: 1433
- Mannitol (labeled)**
 synthesis of, 6: 1700
- Mannose (labeled)**
 synthesis of, 6: 1430
- Manometers**
 (See also Pressure gages; Vacuum gages.)
 design and performance of, 6: 944(J)
- Mass spectrography**
 (See also subheading mass spectrographic analysis under specific materials.)
 ionization potentials determined by, 6: 291(J)
 recent developments in, 6: 1793
- Mass spectrometers**
 (See also Ion sources.)
 application of, to high vacuum problems, 6: 585(J)
 automatic recording, operation of, 6: 288
 design of, 6: 473(P), 1284(J)
 design and resolution of, 6: 1793
 electrostatic-time-of flight, design and operation of, 6: 289
 ion source for, 6: 1574(P), 1580(P)
 as leak detectors and for analyzing H-D mixtures, 6: 1371
 mass doublet comparisons with, 6: 991(J)
 neutralization of space charge in positive ion beams in, 6: 636(J)
 suppression of spurious ions in, 6: 972(J)
- Mass synchrometer**
 performance of, 6: 626
- Massachusetts Inst. of Tech.**
 progress reports, 6: 251(R), 676(R), 1448(R), 1449(R), 1470(R), 1471(R), 1516(R), 1517(R), 1518(R), 1519(R), 1520(R)
 progress reports on solid solutions and grain boundaries, 6: 598(R), 1467(R)
- Materials testing**
 (See also the specific material or equipment concerned or properties being tested; see also Mechanics.)

Materials testing (cont'd.)

- equipment for fatigue testing, 6: 193(J)
- by gamma-ray transmission, 6: 191

Mathematics

- (Including statistics; see also specific problem for application of mathematics; also specific mathematical methods, e.g., Monte Carlo Method; Stochastic methods; etc.; see also Computers; Constants and conversion factors; Perturbation theory; Statistics.) 6: 1561
- in analysis of noise, γ spectra, and γ -ray scattering and transmission, 6: 1285
- calculation of eigenvalues of differential systems, 6: 953
- calculation of orbital and charge-spin correlations, 6: 1364(J)
- classification of symmetrical type of convex regions, 6: 1796
- convex bodies, symmetrization of, 6: 949
- convex regions associated in subspaces, 6: 948
- convex sets and additive set functions, 6: 950
- difference equation approximations, 6: 952
- in neutron transport theory, 6: 1285

Matng

- (See also as subheading under the specific animal.)
- effects of radiation on, in paramecia, 6: 506(R)

Mechanics

- (See also Materials testing.)
- book: Dimensional Analysis and Theory of Models, 6: 1204

Melting point apparatus

- design of window shield for, 6: 1445

Mercury

- boiling and condensing of, 6: 579
- heat transfer to and from flowing, 6: 1199
- self-diffusion in, 6: 1239(R)
- superconductivity of, isotopic factors in, 6: 993(J)
- tissue distribution of, in rats, 6: 496(R)

Mercury cathodes

- design and use of micro, for electrolysis, 6: 1648
- electrodeposition of metals onto, 6: 1393(R)

Mercury isotopes

- alpha emission from, 6: 410, 1556
- half lives of, 6: 1839
- specific heat of, 6: 993(J)

Mercury isotopes Hg^{197}

- decay scheme of, 6: 1925(J)
- formation of, 6: 496(R)

Mercury isotopes Hg^{198}

- energy levels of, 6: 435(J)
- half lives of excited states of, 6: 426(J)
- isomers of, upper limit to half lives of, 6: 1555

Mercury isotopes Hg^{199}

- decay schemes of, 6: 1925(J)
- half lives of excited states of, 6: 426(J)

Mercury isotopes Hg^{203}

- decay schemes of, 6: 307(J)

Mercury-uranium alloys

- chemical analysis of, 6: 545

Merry Widow Claim (New Mexico)

- geology of, 6: 1457

Meson beams

- production of μ , in cyclotron, 6: 322

Meson spectra

- zenithal distribution, 6: 1299(J)

Mesons

- (See also Cosmic mesons.)
- from C^{12} , by proton reactions, 6: 974
- creation of, by fast neutrons passing through nuclei, theory, 6: 330(J)
- π - μ decay model for, 6: 1756
- detection and measurement, decay schemes, and production of, 6: 1756
- detection of τ and κ and formation of π , 6: 1512
- fields, intermediate interaction of nucleons with, 6: 1825(J)
- formation and scattering of, theory, 6: 1544
- interactions and decay of, 6: 673(J)
- interactions with electrostatic field, 6: 1369(J)
- interactions with nucleons and photons, 6: 1055(J)
- mass and decay schemes of, measurement of, 6: 1515(J)
- multiple production of, by cosmic particles, 6: 267(J)
- multiple production of, by nucleon-nucleon collisions, theory, 6: 674(J)
- multiple production of, theory, 6: 325(J)
- paths of, in cyclotrons, 6: 378
- production of, as a function of atomic number, 6: 917
- production of, by cosmic particles in nuclear emulsions, 6: 259(J)
- production of, by nucleon-nucleon collisions, 6: 1301(J)
- production of, by proton-proton collisions, 6: 611(J)
- production of, multiplicity of, 6: 1513

Mesons (cont'd.)

- production of, theoretical model for, 6: 1756
- properties of cloud of, around nucleons, 6: 750(J)
- relative masses of π and μ , 6: 1289(J)
- review of properties of, 6: 977(J)
- scattering and residual range of, in nuclear emulsions, 6: 391(J)
- scattering of, by nucleons, 6: 1039(J)
- scattering of, in gas of diffusion cloud chamber, 6: 315, 316
- scattering of, in Pb plates, 6: 978(J)
- theory of, 6: 745(J), 746(J), 1816
- theory of, limitations of, 6: 1306(J)

Mesons (κ)

- decay schemes of, 6: 1756
- mass and decay of, 6: 1818, 1827(J)

Mesons (μ)

- decay of, 6: 1270(J), 1821(R)
- decay of, relation to beta decay, 6: 1481
- disintegration of, continuous γ spectra in, 6: 1300(J)
- energy of disintegration electrons of, 6: 1298(J)
- ionization in O by, 6: 1824(J)
- range distribution of, 6: 1897(J)
- range straggle of positive, 6: 320
- rest mass and mean lifetime of, 6: 1297(J)
- scattering of, by nuclei, 6: 1818
- star formation, 6: 322
- stopping of negative, in nuclear emulsions, 6: 322
- uranium fission induced by, 6: 1860

Mesons (π)

- absorption and scattering of, in nuclear emulsions, 6: 672(J)
- angular distribution of, from proton-proton collisions, 6: 669
- beta decay of, 6: 976(J)
- charge-exchange scattering of, theory, 6: 326(J)
- decay of negative, in nuclear emulsions, 6: 327(J)
- decay of, selection rules for, 6: 318
- decay schemes of, 6: 655
- electromagnetic interference effects in charged π , p scattering, 6: 1514
- field theory and absorption and scattering of, 6: 1819
- formation and decay of neutral, in proton bombardment of C, 6: 1865
- formation, decay schemes, and scattering of, 6: 1818
- gamma spectra from decay of neutral, 6: 362
- from helium and H by photon reactions, 6: 324
- from hydrogen and D by photon reactions, 6: 671
- interactions of fast, with nuclei, 6: 1826
- interactions of, with C nuclei, 6: 1823(J)
- mass and potential of, 6: 1887
- mass of, from theory of p-n and p-p interactions, 6: 1894(J)
- negative, from deuterium by photon reactions, 6: 321, 323, 1005
- neutral, from Be^9 , B^{10} , B^{11} , C^{12} , O^{16} , H, and D by proton reactions, 6: 670
- neutral, from deuterium by photon reactions, 6: 973, 975
- nuclear scattering cross sections of negative, 6: 319
- photoproduction and properties of neutral, 6: 317
- production of, at relativistic nucleon energies, 6: 1820
- production of, by neutrons on protons, by protons on protons, by protons on C, by deuterons on C, 6: 1821(R)
- properties of, review of, 6: 1822(J)
- reactions of positive, with deuterons, 6: 328(J), 329(J)
- scattering of, in Al, Cu, and Pb, 6: 1821(R)
- scattering of, by H and He, 6: 315
- scattering of negative, by H, 6: 316
- scattering of positive, by He, 6: 1817

Mesons (τ)

- decay schemes and mass of, 6: 1818

Metabolism

- (See also as subheading under specific materials and organisms; see also the subheadings dosage determinations; metabolic effects; mineral metabolism; etc., under specific materials; see also Plant metabolism.)
- in bacteria, as studied by ethanol synthesis in *Pseudomonas lindneri*, 6: 1619(J)
- effects of x radiation on, 6: 510(R)
- of lipoproteins, effects of radiation on, 6: 38

Metal coatings

- (Uses, characteristics, and preparation including metal spraying, vacuum vaporization, and chemical deposition.)
- thickness measurements of, on cylinders by x-ray-diffraction analysis, 6: 1486

Metal crystals

- recrystallization of, mechanism of, 6: 117
- x-ray asterisms from deformed, 6: 1254(J)

Metal halides

- preparation of, apparatus for, 6: 1565(P)

- Metal powders**
(See also specific metal powders.)
sintering of, bibliographies, 6: 602
- Metal trichlorides**
high-temperature hydrolysis of solid, 6: 1753
- Metallic films**
(See also headings for foils identified by material.)
electric conductivity of, theory, 6: 239(J)
- Metallic foils**
scattering of charged particles by, 6: 398(J)
- Metallurgical Lab., Univ. of Chicago**
progress reports, 6: 732(R)
- Metallurgical Labs., Sylvania Electric Products, Inc.**
progress reports, 6: 603(R)
- Metals**
(See also specific metals; see also Alloys; Porous metals.)
bonding of, to glass, role of surface tension in, 6: 202
contamination of, by I^{131} , 6: 883
corrosion of, polarographic study, 6: 1450(R)
corrosion of, symposium on, 6: 210
creep mechanism in, 6: 1733
creep of, equipment for testing, 6: 192
crystal structure of, theory, 6: 1660
deuteron range-energy relation in, 6: 1032(J)
electrolytic cutting of, 6: 1738
fatigue of, at high temperatures, 6: 877
fatigue of, research programs in England, Sweden, France, and Switzerland on, 6: 1722
fatigue testing equipment for, 6: 193(J)
interactions of, with ceramics at high temperatures, 6: 205
melting and sintering of, in vacuum, 6: 246(J)
metallography of, with polarized light, 6: 1228
oxidation of, cubic law of, 6: 1462
recrystallization of, 6: 618(R)
scaling behavior of, 6: 1731
surface area of, apparatus for determination of, 6: 897
thermodynamic properties of, 6: 1471(R)
vapor pressure chart for, 6: 1734
welding of, by resistance method, 6: 181
- Metals (liquid)**
(See also specific metals and alloys.)
heat transfer characteristics of, effects of wetting on, 6: 186(R)
heat transfer to and from, in annuli and circular tubes, 6: 1198
thermal conductivity of, measurement of, 6: 1444(J)
- Metals Research Lab., Carnegie Inst. of Tech.**
progress reports, 6: 599(R), 601(R), 1473(R)
- Meteorites**
ratio of O isotopes in, 6: 1744(J)
- Meteorological instruments**
(See also specific instruments.)
design of, for study on turbulence and diffusion of particulate matter in lower layers of the atmosphere, 6: 1516(R), 1517(R), 1518(R), 1519(R)
- Meteorology**
(See also as subheading under specific sites, installations, and geographic areas; see also the subheading meteorological factors under phenomena affected; see also Atmosphere; Stack disposal.)
atmospheric diffusion from a point source, 6: 979
intensities of atmospheric turbulence, 6: 331(J)
turbulence and diffusion of particulate matter in atmosphere, 6: 676(R)
vertical wind gradient apparatus, 6: 938
- Methane**
halo derivatives, quadrupole spectra and couplings of Cl^{35} in, 6: 1308(J)
ionization potential of, by mass spectrography, 6: 291(J)
molecular vibration of, and of its deuterated forms, 6: 137(J)
thermal capacity of, adsorbed on TiO_2 , 6: 868
- Methane, fluoro-**
virial coefficients of, 6: 128(J)
- Methanol**
adsorption of, on C, 6: 1425(R)
proton resonances in, effects of temperature on, 6: 1671(J)
- Methionine**
determination of, by nitroprusside reaction, 6: 812
role of, in synthesis of adenine thiomethylriboside in yeasts, 6: 1072
- Methylamine**
protective action of, against x radiation, 6: 1385(J)
- Methylene blue**
effects on concentration of K in erythrocytes, 6: 791
- Mice**
effects of air blasts on, 6: 12
effects of x radiation on, 6: 45
quarters for, criteria for air conditioning, 6: 1373
- Mice (cont'd.)**
a transmissible disease in, characterized by anemia, leukopenia, and erythropoietic splenomegaly, 6: 1071
- Microorganisms**
(See also Bacteria; Yeast; etc.)
effects of radiation on, 6: 916(R)
- Microwave spectroscopy**
(See also subheading spectra under specific materials.) 6: 1750(R)
in studies of OCS, 6: 340(J)
- Microwaves**
absorption of, 6: 1782(R)
detection and measurement of, 6: 1750(R)
determination of collision probability for slow electrons in gases using, 6: 1490
generation of, 6: 1750(R)
resonant behavior of spheroidal cavity system in region of, 6: 253
tubes for generation of, design, 6: 1782(R)
- Minerals**
(See also specific minerals; see also Radioactive minerals.)
beneficiation of, 6: 251(R)
colorimetric analysis of, for Th, 6: 1401
electrostatic separation of, bibliography on, 6: 1423
flotation of, tracer studies of, 6: 251(R)
radioactive decay rate and age estimations of, 6: 425(J)
uranium determination in, by fluorimetric analysis, 6: 1404(J)
- Minnesota Mining and Manufacturing Co.**
progress reports, 6: 1701(R)
- Minnesota Univ.**
progress reports, 6: 891(R)
- Missouri**
uranium distribution in, 6: 1728(J)
- Mitochondria**
oxidation of pyruvate in suspensions of, 6: 760
- Mitosis**
(See also the subheading mitotic effects under materials, radiations, etc., causing mitosis; see also Chromosomes; Genetics.)
mechanics of, and effects of colchicine on, 6: 502(R)
- Molds**
(See also Fungi.)
effects of radiation on, 6: 916(R)
- Molecular beams**
(See also Ion beams.)
focusing by magnetic field, theory and apparatus for, 6: 1335(J)
- Molecular structure**
(See also as subheading under specific materials.)
interpretation and theory of, 6: 1302(R)
relation to nuclear relaxation time in hydrocarbons, 6: 1418(J)
sum rules for frequencies of isotopic molecules, 6: 1417(J)
theory of, 6: 138(J)
- Molecules**
centrifugal distortion in asymmetric, 6: 1521
- Molybdenum**
coating, fabrication, mechanical properties, and production of, review of current status of, 6: 1466
corrosion of, by Bi-Pb eutectic, 6: 901
corrosion of, by liquid Bi, 6: 900
determination of, in U-Mo alloys, 6: 544
effects of impurities on the band ductility of cast, 6: 1740(J)
electric conductivity of, effect of elastic deformation on, 6: 241(J)
gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538
proton reactions (p,n), 6: 1859
proton reactions (p,n), thick-target yield in, 6: 1535
separation of, from fission products, 6: 1424(R)
thermoelectric power of, effect of cold work and annealing on, 6: 1741(J)
vapor pressure between 2151 and 2462°K, 6: 88
volumetric determination of, 6: 1402(J)
welding of, 6: 227
x-ray spectra of, 6: 97(J)
- Molybdenum-aluminum compounds (intermetallic)**
x-ray-diffraction analysis of, 6: 199
- Molybdenum complexes**
with 2-methyl-8-quinolinol, stability of, 6: 1141(J)
- Molybdenum isotopes**
decay schemes of, 6: 1907
yields of, in U^{235} fission, 6: 1327(J)
- Molybdenum isotopes Mo^{98}**
energy level diagram of, 6: 419(J)
- Molybdenum isotopes Mo^{97}**
binding energy of, calculation, 6: 333(J)
- Molybdenum isotopes Mo^{99}**
yield of, from proton-induced fission of U, 6: 1856

- Molybdenum single crystals
 crystal structure and plastic deformation of, 6: 1736(R)
- Molybdenum-tantalum alloys
 phase studies of, 6: 1256(J)
- Molybdenum-uranium alloys
 chemical analysis of, 6: 544
- Molybdenum-zirconium alloys
 constitution diagrams of, 6: 591(R)
 crystal structure of, 6: 249(J)
- Monazite
 (See also Thorium ores; Uranium ores.)
 fluorimetric analysis of, for U, 6: 1136
- Morocco
 exploration of uraniferous phosphate deposits in, 6: 1461(J)
 identification of pitchblende and tungsten minerals in, 6: 1460(J)
- Morphine (labeled)
 synthesis of, 6: 1180(J)
- Morrison formation
 geology of, 6: 1458
- Mortars
 (See also Cements.)
 properties of, 6: 1437
- Mound Lab.
 progress reports, 6: 960(R), 1278(R)
- Mullite
 thermal conductivity of, 6: 204
- Multiple sclerosis
 radiotherapy of, indirect irradiation in, 6: 66(J)
- Multiplication factor
 (See also as subheading under reactors.) 6: 1000
- Muscles
 electrolyte retention in, following x irradiation, 6: 1077
- Mutations
 (See also subheading mutation under specific organisms.)
 dose-frequency curve for radioinduced, 6: 777(J)
 as explanation for inheritance of reduced vigor, 6: 140
 induced by x radiation, in *Drosophila*, 6: 8, 770(J)
 induced by x radiation, origin of, 6: 769(J)
 in plants from irradiated seeds, 6: 32
 radioinduced in fungi, 6: 1085
 theory of, 6: 6
- Myristic acid
 incorporation of, into phospholipides by rats, 6: 798(J)
- Naphthalene
 absorption spectra and fluorescence of, 6: 1695
- 1,4-Naphthoquinone, 2-methyl-
 effects on concentration of K in erythrocytes, 6: 791
- 1-Naphthylamine, N-phenyl-
 fluorescence of, α - or γ -induced, 6: 653(R)
- National Bureau of Standards
 progress reports, 6: 1279(R), 1497(R)
- National Research Corp.
 progress reports, 6: 223(R)
- Neodymium
 thermodynamic properties of, 6: 560, 840
- Neodymium chlorides
 activity coefficients, conductances, and transference numbers of, 6: 562
 activity coefficients of, in aqueous solutions, 6: 558
 absorption spectra of, 6: 1628
 thermodynamic properties of, 6: 560, 839
 transference numbers of, 6: 563
- Neodymium compounds
 thermodynamic properties of, 6: 840
- Neodymium isotopes
 cross sections for formation of, in neutron irradiation of Nd_2O_3 , 6: 1424(R)
 decay schemes of, 6: 1907
- Neodymium oxalates
 thermodynamic properties of, 6: 560
- Neodymium oxides
 heat content, specific heat, and entropy of, 6: 147(J)
- Neodymium sulfates
 paramagnetic resonance absorption in, 6: 1359(J)
- Neon
 collision probability for slow electrons in, 6: 1490
- Neon isotopes Ne^{20}
 binding energy of, calculation, 6: 333(J)
- Neon isotopes Ne^{21}
 spin and parity of, 6: 1859
- Neptunium
 discovery and identification of, lecture on, 6: 1835
- Neptunium isotopes Np^{236}
 decay schemes of, 6: 736
- Neptunium isotopes Np^{237}
 nuclear properties of, 6: 1928
 x-ray emission from, 6: 413
- Nerve cells
 effects of ultraviolet radiation on, in grasshoppers, 6: 43(J)
- Netherlands-Norwegian heavy water reactor
 (See Jeep reactor.)
- Neutrinos
 distinction between neutrino and antineutrino, 6: 1368(J)
 emission of, from P^{32} , 6: 1909
 rest mass of, upper limit for, 6: 1837(J)
 theory of, in Te^{130} double β decay, 6: 1793
- Neutron beams
 collimation of, 6: 1535
 preparation of very low energy, 6: 493(J)
- Neutron cross sections
 (See also as subheading under specific materials; see also main and subheadings for specific neutron cross sections, e.g., Neutron absorption cross sections; Neutron capture cross sections; see also the subheading neutron reactions under materials.)
 measurement of, 6: 493(J), 980, 1023(J), 1503, 1860
 theory of, 6: 686
- Neutron diffraction analysis
 (See also as subheading under specific material.)
 of single crystals, 6: 619(J)
- Neutron scattering cross sections
 (See also as subheading under specific materials.)
 of protons, effect of potential well shape on, 6: 1340
 theory of, 6: 1830
- Neutron shielding
 (See also as subheading under heading for apparatus shielded.)
 design of, lecture on, 6: 1360
 theory of, 6: 441(J)
- Neutron sources
 design of, 6: 480(P)
- Neutron spectra
 (See also as subheading under specific materials; see also the subheading neutron emission under specific elements and isotopes.)
 from $\text{Mn}^{56}(\text{p}, \text{n})$ reaction, 6: 1877(J)
- Neutron spectrometers
 design of, 6: 641
- Neutrons
 (See also Cosmic neutrons; Fast neutrons; Neutron beams; Neutron sources; Photoneutrons; Thermal neutrons.)
 from (α, n) reactions in impurities in fissile material, 6: 1536
 attenuation of, in water and paraffin, 6: 441
 beta decay of, theory, 6: 1920(J)
 from $\text{C}^{12}(\text{d}, \text{n})$, angular distribution of, 6: 708(J)
 cataract production by, 6: 505
 chemical effects of capture of, 6: 1679(J)
 coherent scattering of, by hydrocarbons, 6: 1903(J)
 decay of, 6: 678(J)
 density-indicator for, 6: 1583(P)
 disintegration of He by, 6: 1004
 dosage determination, 6: 1(R)
 effects on barley seed, 6: 41(J)
 effects on enzymes, 6: 40(J)
 effects on semiconductors, 6: 557(J)
 emission of, from spontaneous fission of Th, 6: 1851(J)
 exchange force in interactions of, with protons, 6: 1326
 from fission of U^{235} , energy distribution of, 6: 698
 inelastic scattering of, by deuterons, 6: 1031(J)
 interactions of, with electrons, 6: 679, 1832(J)
 interactions of, with protons, 6: 386, 1346(J)
 magnetic lens for focusing of, 6: 1860
 mass of, compared with H mass, 6: 349(J)
 mass of, from nuclear reaction energies, 6: 992(J)
 mass of, from $\text{T}(\text{p}, \text{n})\text{He}^3$, 6: 1859
 π^- -mesons from, in deuterium by photon reactions, 6: 323
 multiplicities of, from μ -meson capture in Pb, 6: 1759(J)
 polarization and scattering of, by ferromagnetic materials, 6: 1038(J)
 polarization in scattering of, by protons, 6: 715
 production of, by (α, n) reactions in Be, 6: 1537
 radioactivity of, 6: 1909
 reflection of, from single crystals, 6: 493(J)
 scattering of, in air, 6: 1(R)
 scattering of, by deuterons, theory, 6: 720(J)

Neutrons (cont'd.)

- scattering of, by meson fields, theory, 6: 1042(J)
- scattering of, by protons, 6: 381, 387, 1043(J), 1340
- scattering of, theory, 6: 724(J)
- star production by, in nuclear emulsions, 6: 1534
- total reaction cross sections for, with Be, C, N, and Na, 6: 1017(J)
- transmission in polycrystalline media, extinction effects on, 6: 1341
- transport theory, 6: 332(J), 384, 1285

New Mexico (Grant Co.)

- exploration of Lode deposits in Merry Widow Claim and White Signal District for U, 6: 1457

New York Univ.

- progress reports, 6: 653(R), 677(R), 1392(R), 1749(R)

Nichrome

- (See Nickel alloys.)

Nickel

- angular distribution of photoneutrons from, 6: 1861
- anion exchange of, in HCl, 6: 1689(J)
- cathodic sputtering of, 6: 252
- corrosion of, by acids, 6: 1217
- corrosion of, by H_2O_2 , 6: 240(J)
- creep mechanism in, 6: 1733
- deuteron range-energy relation in, 6: 1032(J)
- electrolytic separation from V, 6: 90(R)
- electroplating of, 6: 599(R)
- neutron cross sections of, 6: 1526
- neutron scattering cross sections of, 6: 1304(R)
- scattering of neutrons by, 6: 980

Nickel alloys

- corrosion of, by Bi-Pb eutectic, 6: 901
- corrosion of, by H_2O_2 , 6: 240(J)
- corrosion of, by liquid Bi, 6: 900
- permeability of inconel to He, 6: 272

Nickel-aluminum alloys

- crystal structure of, in β phase, 6: 242(J)

Nickel-aluminum compounds (intermetallic)

- x-ray-diffraction analysis of, 6: 199

Nickel-chromium-cobalt-iron alloys

- creep properties of, effects of cold-work on, 6: 1207

Nickel complexes

- with 2-methyl-8-quinolinol, stability of, 6: 1141(J)

Nickel compounds

- chelation of, with β -diketones, 6: 1634

Nickel-copper alloys

- diffusion in, 6: 603(R)

Nickel-copper couples

- porosity of, metallographic studies on, 6: 1474

Nickel-copper-zinc alloys

- coating, corrosion, and physical properties of, 6: 1465

Nickel(II) fluorides

- neutron diffraction analysis of, 6: 1548

Nickel-gold alloys

- phase studies of, 6: 1467(R)

Nickel-iron alloys

- phase transformations in, 6: 600(R)
- porous, powder metallurgy and physical properties of, 6: 1233(R)
- strains in, caused by martensitic transformation, 6: 594
- surface tension of, effect of composition on, 6: 205

Nickel-iron-tantalum alloys

- composition and physical properties of, 6: 909(J)

Nickel isotopes Ni^{56}

- formation and half lives of, from Zn spallation, 6: 1864

Nickel isotopes Ni^{58}

- binding energy of, 6: 989(J)
- gamma reactions (γ, n), 6: 1871(J)

Nickel isotopes Ni^{59}

- mass of, 6: 368(J)

Nickel isotopes Ni^{60}

- binding energy of, 6: 989(J)

Nickel isotopes Ni^{65}

- neutron capture cross sections, 6: 1628

Nickel(II) nitrate systems

- phase studies of 1-hexanol-, 6: 81

Nickel oxides

- ionization of, 6: 541(J)

Nickel-titanium alloys

- creep mechanism in, 6: 1733

Nickel-uranium alloys

- magnetic susceptibility of, 6: 1433

Nickel-vanadium alloys

- structure of σ phase of, 6: 1476(J)

Nicotine

- biosynthesis of, mechanism of, 6: 1618
- tissue distribution and excretion of, 6: 74(J)

Niobium

- colorimetric determination of, with thiocyanate, 6: 1143(J)
- corrosion of, by Bi-Pb eutectic, 6: 901
- corrosion of, by liquid Bi, 6: 900
- extraction of, from sovite, 6: 219(J)
- purification of, by volatilization or solution of chlorides, 6: 847(J)
- separation from Ta, 6: 846(J)
- spectrophotometric determination of, 6: 1405(J)
- x-ray spectra of, 6: 97(J)

Niobium borides

- crystal structure and properties of, 6: 120

Niobium bromides

- trouton constants of, 6: 810(J)

Niobium chlorides

- trouton constants of, 6: 810(J)

Niobium-chromium alloys

- crystal structure of, from x-ray-diffraction data, 6: 1249(J)

Niobium fluorides

- vapor pressure of, 6: 810(J)

Niobium isotopes Nb^{91}

- internal conversion and isomeric transition of, 6: 419(J)

Niobium isotopes Nb^{92}

- electron capture, 6: 419(J)

Niobium isotopes Nb^{93}

- preparation of carrier-free, 6: 1422

Niobium isotopes Nb^{94}

- internal conversion and isomeric transition of, 6: 409

Niobium isotopes Nb^{95}

- decay schemes of, 6: 650(R)

- internal conversion and isomeric transition, 6: 419(J)

Niobium isotopes Nb^{96}

- decay schemes of, 6: 419(J)

Niobium nitrides

- preparation of, 6: 1642(J)

Niobium oxides

- electrolysis of, in phosphate melts, 6: 811(J)

Niobium phosphides

- preparation of, by electrolysis, 6: 811(J)

Niobium-tantalum alloys

- tensile properties of, 6: 1475(R)

Nitric acid

- decontamination of, by distillation, 6: 882(R)

Nitrides

- fluorination of, 6: 134(J)

Nitrogen

- adsorption of, on C, 6: 1425(R)
- collision probability for slow electrons in, 6: 1490
- compressibility isotherms and thermodynamic functions of mixtures of, with H_2 and NH_3 , 6: 1275(J)
- compressibility of, at 3097 to 6292 atm, 6: 187(J)
- diffusion of, in Zr, 6: 898
- effects of interstitial, on superconductivity of V, 6: 1739(J)
- effects on crystal structure of Zr, 6: 229(R)
- fixation of, by photosynthetic bacteria, 6: 71
- fixation of, in a crossed discharge, 6: 620
- neutron and proton charge-exchange reactions in, 6: 1881(J)
- neutron total cross sections for, 6: 1017(J), 1525
- proton scattering cross sections of, 6: 1546
- radiosensitivity effects of, 6: 48
- scattering of x radiation by, 6: 400(J)
- surface reaction of, with Zr, 6: 898
- thermo-osmosis of, through rubber, 6: 1776(J)
- transition probabilities for N_2 by dipole velocity operator, 6: 256

Nitrogen isotopes

- energy states of, 6: 1859

Nitrogen isotopes N^{13}

- energy levels and nuclear spin of, 6: 708(J)

- yield of, from $C^{12}(p, \gamma)$, 6: 1879(J)

Nitrogen isotopes N^{14}

- binding energy of, calculation, 6: 333(J)
- deuteron reactions (d, α), 6: 1870(J)
- energy levels of, 6: 367(J), 1329(J)
- gamma (γ, n) cross sections, 6: 1332(J), 1861
- gamma emission of, from $C^{13}(p, \gamma)$, 6: 1875(J)
- neutron reactions (n, α) and (n, p), 6: 1007(J)
- neutron total cross sections of, 6: 407(R)
- proton reactions (p, γ), 6: 1535

Nitrogen isotopes N^{15}

- binding energy of, calculation, 6: 333(J)
- deuteron reactions (d,p), 6: 1870(J)
- formation of, by the reaction N^{14} (d,p), 6: 1870(J)
- infrared spectra of, isotope shift in, 6: 445
- isotope effect in thermal deamination of phthalamide, 6: 1118

Nitrogen mustards

- chemical effects of x radiation on, 6: 1680(J)
- effects on cell division in *Paramecium*, 6: 1108
- genetic and physiological effects of, 6: 506(R)

Nitrogen oxides

- effects on formation of triplet positronium in gases, 6: 1305
- ionization potential of, by mass spectrography, 6: 291(J)

Nitrous acid

- reaction with alkyldihydroxylamines, 6: 1628

Noise

- (Including theoretical calculations and experimental observations.)
- mathematical analysis, 6: 1285
- study of nonlinear devices by correlation methods, 6: 1751
- theory of thermal, in calorimeters, 6: 960(R)

Norman Bridge Lab. of Physics, Calif. Inst. of Tech.

- progress reports, 6: 444(R), 446(R)

North Carolina State Coll.

- progress report, 6: 1446(R)

Norwegian-Dutch Heavy Water Reactor

- (See *Jeep reactor*.)

NRX reactor

- (Canada)
- general description of, 6: 355(J)
- shutdown of, effect of delayed neutrons on, 6: 1831

Nuclear aircraft

- turbojet engines for, 6: 1589

Nuclear emulsions

- (See also *Photographic film detectors*; *Photographic films*.)
- blackening of, by β particles, 6: 1287
- calibration of, 6: 661(J)
- calibration of, for scattering constant, 6: 1807(J)
- development of latent image in, 6: 1289(J)
- electron-electron scattering determinations with, 6: 917
- grain density of electron tracks in, 6: 1293(J)
- loading of, with wires, 6: 308(J)
- measurement of α -particle and triton tracks in, 6: 644
- measurement of thickness changes in, vs. humidity, 6: 298
- in μ -meson mass determinations, 6: 1297(J)
- multiple coulomb scattering of electrons and protons in, 6: 1550(J)
- nuclear disintegrations produced in, by cosmic rays, 6: 259(J), 1761(J)
- preparation of, and cosmic particle tracks in, 6: 1512
- range-energy relations of electrons in, 6: 1295(J)
- range of protons and mesons in, 6: 391(J)
- sensitivity of, to x radiation, 6: 311(J)
- stars produced in, by neutrons and protons, 6: 1534
- stars and single tracks in, analysis and origin, 6: 1287(J)
- techniques for studying nuclear collisions with, 6: 1328(J)
- thickness measurement of, 6: 642
- tracks of fast C^{12} nuclei in, 6: 656

Nuclear engineering

- contribution of, to nuclear energy development, lecture on, 6: 1188
- curriculum at North Carolina State College in, 6: 1194
- curriculum of the Oak Ridge School of Reactor Technology, 6: 1192
- impact of atomic energy on training of engineers, lecture on, 6: 1191
- results of a questionnaire on training programs in, 6: 1193
- role of, in nuclear energy development, Third Annual Oak Ridge Symposium 1951, 6: 1186
- role and training of nuclear engineers, lecture on, 6: 1187
- scope of, lecture on, 6: 1190

Nuclear magnetic moments

- apparatus for measurement of, 6: 1849(J)
- hyperfine structure anomaly in measurements of, 6: 1839
- and j—j coupling shell model, 6: 1845(J)
- measurement of, by nuclear resonance absorption, 6: 995(J)
- methods of measurement, 6: 1307(J)

Nuclear magnetic resonance

- theoretical interpretations of multiple lines of, 6: 351(J)

Nuclear models

- energy levels of, 6: 691(J)
- in fission, 6: 1840
- for light nuclei, 6: 1839

Nuclear models (shell)

- and beta decay, 6: 740(J)
- comparison of, with atomic shell structures, 6: 685(J)
- discontinuities in neutron and proton binding energies, 6: 1424(R)

Nuclear models (shell) (cont'd.)

- energy variation of asymmetric, 6: 1934(J)
- magic numbers, 6: 1314(J)
- nuclear magnetic moments using j—j coupling, 6: 1845(J)
- in explanation of β -decay theory, 6: 408

Nuclear particles

- (See also the specific particle concerned; see also *Elementary particles*.)
- angular correlations of, in nuclear resonance reactions, 6: 374(J)
- angular correlations of emitted, influence of magnetic fields on, 6: 346(J)
- density of, in the nucleus, 6: 686
- dependence of primary specific ionization upon momentum for high-energy, 6: 1758(J)
- derivation of a wave equation for, with two mass states and a positive charge density, 6: 1562(J)
- emission of, angular correlations functions, 6: 350(J)
- interaction moments of, 6: 335
- interactions of, quantum mechanical description of, 6: 683(J)
- interactions of, time-dependent, 6: 682(J)
- interactions of, with a central pseudoscalar field, 6: 752(J)
- multiple scattering of charged, theory, 6: 1902(J)
- multiple-scattering theory for fast singly-charged, 6: 1807(J)
- pair production in collisions of, 6: 1333(J)
- range straggling of nonrelativistic charged, 6: 1897(J)
- scattering of, by meson fields, theory, 6: 1042(J)
- spin of, relativistic theory of, 6: 457(J)
- spin, reactions, and existence of, 6: 1818

Nuclear physics

- basic concepts of, lecture on, 6: 1261
- proceeding of International Conference on, Sept. 1951, Univ. of Chicago, 6: 1833
- research program at the Institute for Nuclear Physics, Hamburg, 6: 1372
- research program at the Universities of Brussels and Louvain, Belgium, 6: 1523
- summaries of papers presented at "Conference on Problems of Quantum Physics," Copenhagen, Denmark, July 6-10, 1951, 6: 1522
- survey of Harwell contributions to, 6: 1524(J)

Nuclear power

- (See also *Nuclear aircraft*.)
- application of, to rocket propulsion, 6: 1066
- economic and industrial aspects of, 6: 1001(J)
- economic aspects of, 6: 1068(J), 1317
- heating of building at the Atomic Energy Research Establishment, Harwell, 6: 1068(J)
- production of, 6: 489, 490

Nuclear radiation

- (See also specific radiations, e.g., *Alpha particles*; see also subheadings under specific elements and isotopes for emitted radiations, e.g., *neutron emission*. See also *Nuclear reactions*.)
- angular correlation functions of, 6: 990(J)
- theory of scattering of, impulse approximation, 6: 1544

Nuclear reactions

- (See also as subheading under specific radiations; see also the subheading *nuclear properties* and subheadings in the form *neutron reactions* under specific elements and isotopes; see also *Beta decay*; *Neutron cross sections*.)
- distribution of products of, theory, 6: 360
- energies of, 6: 1533
- energy requirements for, calculation of, 6: 1019(J)
- excitation functions and cross sections for (p,n), 6: 1022(J)
- lecture on, 6: 1261
- measurement of, by comparison using an ionization chamber, 6: 1576(P)
- photographic technique for study of, 6: 1328(J)
- quantum mechanical description of, 6: 683(J)
- time-dependent description of, 6: 682(J)

Nuclear structure

- (See also as subheading under specific elements and isotopes; see also *Nuclear models*.)
- momentum distribution of nucleons, 6: 1818
- wave functions for the p shell, 6: 1364(J)

Nuclear theory

- electrical dipole γ cross sections, 6: 1013(J)
- triplet force between like nucleons, 6: 1561

Nuclei

- (See also subheadings under elements and isotopes for properties and reactions of specific nuclei; also headings beginning with *Nuclear*.)
- acceleration of multiply charged, 6: 379
- alignment by magnetic resonance, 6: 1311(J)
- alpha decay rates, correlation of, 6: 363

Nuclei (cont'd.)

- alpha emission from even-even, 6: 415
- alpha emission from medium heavy, 6: 410
- angular distribution of γ radiation from polarized, 6: 1842(J)
- calculation of final state of, from internal conversion coefficient, 6: 1064(J)
- classification of isomers of, 6: 1839
- energy and electric quadrupole moments of, 6: 344(J)
- energy levels of, use of scintillation spectrometer in studying, 6: 424(J)
- excited states and structure of even-even, 6: 1836(J)
- finite size of, effect on elastic scattering of electrons, 6: 1904(J)
- gamma absorption cross sections, 6: 334
- gamma emission of, theory, 6: 983(J)
- interaction of, with fast π -mesons, 6: 1826(J)
- K-capture of, in relation to Z, 6: 1053(J)
- magic numbers, 6: 1314(J)
- magnetic resonance of, Bloch formulation for interpretation of, 6: 348(J)
- mass of, from nuclear reaction energies, 6: 992(J)
- nuclear magnetic moments, non-additivity of, 6: 335
- nuclear magnetic moments of, theory, 6: 684(J)
- nuclear spin of, theory, 6: 684(J)
- packing fraction curves, 6: 1793
- photon reactions (γ, n), 6: 364, 1326
- photoneutron thresholds of, 6: 706(J)
- polarization and alignment of, 6: 1846(J)
- proton reactions (p, γ), 6: 337
- proton reactions (p, n), excitation functions for, 6: 1022(J)
- radiative correction to angular distribution of recoil, from electron scattering, 6: 1545
- radii of, review of methods of measurement, 6: 1313(J)
- shell structure and properties of, 6: 982
- statistical analysis of (γ, p) and (γ, n) reactions of, 6: 1858
- surface tension and binding energy of, calculation, 6: 333(J)
- vibration-rotation spectra of, 6: 981(J)

Nuclei (cells)

(See also cytological subheadings under organs, organisms, radiations, etc.; see also Chromosomes; Cytochemistry; Genetics; Mitosis; Nucleic acids; Nucleotides.)

- analysis of, for ribonucleotides, 6: 112(J)

Nucleic acids

- biosynthesis of, and radioautographic measurement of, using P^{32} , 6: 149
- effects of radiation on, 6: 1595
- incorporation and retention of C^{14} in, 6: 566
- metabolism of, bibliographies on, 6: 566

Nucleon showers

- theory of, 6: 753(J)

Nucleons

(See also specific nucleons, e.g., Protons.)

- deuteron scattering cross sections of, theory, 6: 1547
- elastic scattering matrix of, 6: 1306(J)
- interactions of, 6: 386
- interactions of, theory, 6: 747(J)
- interactions of, with external electromagnetic fields, 6: 1838
- interactions of, with mesons and photons, 6: 1055(J)
- nucleon scattering by, theory, 6: 1894(J)
- recoil of, effect on nuclear forces, 6: 748(J)
- scalar meson field of, 6: 1825(J)
- scattering of, by nucleons, 6: 1052(J)
- wave functions of, in momentum space, 6: 1936(J)

Nucleosides

- determination of, by nitroprusside reaction, 6: 812
- separation of, 6: 1072
- synthesis of, in yeasts, 6: 1072

Nucleotides, dihydridiphosphopyridine

- oxidation of, by x radiation, 6: 506(R)

Nucleotides, pyridine diphosphate-

- effects on pyruvate oxidation in mitochondria, 6: 760

Nylon

(See Plastics.)

Oak Ridge National Lab.

- progress reports, 6: 1485(R)
- progress reports on instrument research and development, 6: 277(R)
- progress reports, Health Physics Div., 6: 1(R)

Oak Ridge School of Reactor Technology

- development and curriculum of, lecture on, 6: 1192

2-Octanone

- solubility of metallic nitrate hydrates in, 6: 83

Old and Barnes, Inc.

- progress reports, 6: 403(R)

Opal (uraniferous)

- occurrence of, in Argentina, 6: 215(J)

Oregon Univ.

- progress reports, 6: 59(R), 1450(R)

Organic acids

(See also specific organic acids.)

- spectrophotometric analysis of mixtures of, 6: 816

Organic compounds

(Specific organic compounds are indexed according to precedents found in such standard reference works as Chemical Abstracts; Handbook of Chemistry and Physics; Index Medicus; Biological Abstracts; etc.; see also Organic compounds (labeled).)

- effects of γ radiation on, measurement of, 6: 145(J)
- isotopic analysis of, 6: 104
- polarographic behavior of, 6: 808(R)
- polymerization of, by electrons, 6: 141(J)
- proton stopping by, 6: 718
- spectrographic analysis of, for inorganic constituents, 6: 158
- Organic compounds (labeled)
- chemical analysis and isotopic assay of, 6: 1628
- determination of C^{14} in, by wet combustion, apparatus for, 6: 1408(J)

Organic syntheses

(See also Reaction mechanisms (organic).)

- bibliographies on use of organolithium compounds in, 6: 166

Organs

(See also the specific organs.)

- blood volume in, measurement of, 6: 765

Orsellinic acid (labeled)

- synthesis of, 6: 174(J)

Oscillographs

(Including oscilloscopes.)

- danger of exposure to x-rays from, 6: 783(J)
- design of, 6: 1511

Oscillators

(See also Pulse generators.)

- design of f-m audio, for telemetering systems, 6: 1783
- design of, for measurement of radiation, 6: 1(R)

Oxalic acid

(Common salts are indexed in the form Nickel oxalates.)

- decarboxylation of, C^{13} - C^{14} isotope effect in, 6: 832
- thermodynamic properties of, 6: 560

Oxamide, dithio-

- acidity constant, solubility product and solubility of, 6: 1629

Oxamide, dithio- complexes

- spectrophotometric analysis, 6: 1653

Oxazolones

- ultraviolet spectra of, 6: 850

Oxidation

(See also as subheading under materials oxidized.)

- mechanism of catalytic, of CO, 6: 177(J)
- radioinduced, 6: 146(J)

Oxygen

- determination of, bibliography on, 6: 110
- determination of, in Fe by H reduction, 6: 1658(R)
- determination of, in Sn, 6: 1137
- effects of, on crystal structure of Zr, 6: 229(R)
- effects of interstitial, on superconductivity of V, 6: 1739(J)
- effects on radiosensitivity
- (See Oxygen effect.)
- evolution of, by isolated chloroplasts, 6: 534
- induction of chromosomal aberrations in pollen by, 6: 4
- ionization in, by μ mesons, 6: 1824(J)
- neutron and proton charge-exchange reactions in, 6: 1881(J)
- neutron total cross sections of, 6: 1023(J), 1525
- nuclear momentum distribution in, inferred from proton scattering, 6: 1841
- proton range-energy relation in, effect of O_2 pressure on, 6: 1339
- proton scattering cross sections of, 6: 1546
- solubility of, in K and Na-K alloys, 6: 1237

Oxygen effect

- on chromosomal aberrations in pollen, 6: 4
- on radiation damage in paramecium, 6: 46
- on x-ray-induced aberrations in chromosomes, 6: 26
- on x-radiation induction of aberrations in chromosomes, 6: 24

Oxygen isotopes

- abundance of, in rocks, 6: 1793
- ratio of, in rocks and meteorites, 6: 1744(J)
- review of preparation, properties, and chemical applications of, 6: 1124(J)

Oxygen isotopes O^{16}

- energy levels of, 6: 1535

- Oxygen isotopes O^{16}
 alpha reactions (α, p), 6: 1011(J)
 deuteron reactions (d, p), 6: 1869(J)
 deuteron reactions (d, p and d, α), 6: 1329(J)
 fast neutron scattering from, 6: 1895(J)
 gamma (γ, n) cross section, 6: 1332(J), 1861
 gamma reactions (γ, α), 6: 699
 gamma reactions (γ, n), 6: 963
 gamma reactions (γ, n), resonances in, 6: 372(J)
 π^0 mesons from, by proton reactions, 6: 670
 neutron reactions (n, α), 6: 1018(J)
 neutron scattering cross sections, 6: 1859
 nuclear stability, 6: 1314(J)
 Oxygen isotopes O^{17}
 energy levels, 6: 1329(J), 1895(J)
 mass, nuclear spin, and relative abundance of, 6: 340(J)
 nuclear spin of ground state and excited state, 6: 1869(J)
 properties of energy states of, 6: 1859
 Oxygen isotopes O^{18}
 proton reactions (p, n), excitation functions for, 6: 1021(J)
- Paint
 preparation of, for high temperature use, 6: 885
- Paleotemperatures
 mass spectrographic determination of, 6: 1793
- Palladium
 spectra of, isotope shift in, 6: 693(J)
 x-ray spectra of, 6: 97(J)
- Palladium isotopes
 isomeric transition of, 6: 409
- Palladium isotopes Pd^{106}
 nuclear spin and magnetic dipole moment of, 6: 693(J)
- Palladium isotopes Pd^{111}
 neutron capture cross sections, 6: 1628
- Palladium-silver couples
 porosity of, metallographic studies on, 6: 1474
- Palmitic acid
 oxidation of, in rat tissues, 6: 792
- Paramagnetic salts
 relaxation of, size and thermal conductivity effects in, 6: 608(J)
 review of properties of, for low temperatures, 6: 921(J)
- Paramecium
 effects of diethanolamine salt of maleic hydrazide on, 6: 763
 effects of nitrogen mustard on cell division in, 6: 1108
 effects of radiation on, chemical modification of, 6: 46
 effects of x radiation on, chemical modification of, 6: 48
 effects of x radiation and nitrogen mustards on, 6: 506(R)
 inheritance of reduced vigor in, 6: 140
- Parasymphomimetic substances
 (See Vagomimetic substances.)
- Particle collectors
 (See also Electrostatic precipitators.)
 impaction efficiency of, 6: 1708
- Particle trajectories
 mathematical analysis of, in an axial focusing double lens spectrometer, 6: 1795(J)
 mathematical analysis of, in cyclotrons, 6: 378
- Particles
 (See also headings by name of materials, e.g., Nickel powders; see also Aerosols; Dusts; Elementary particles; Nuclear particles; Powders; V particles.)
 Dirac, unitary transformation of Hamiltonian, 6: 292
 erosive effects of, on bends in circular conduits, 6: 185
 relation between extinction coefficient and size of, 6: 919(J)
 size measurement of, by x-ray scattering, 6: 782
 spacial size measurement of, by "line-area" method, 6: 1463
- Pennsylvania State Coll.
 progress reports, 6: 808(R)
- Pennsylvania State Coll., School of Mineral Industries
 progress reports, 6: 116
- Pentobarbital sodium
 protective action of, against x radiation, 6: 1386(J)
- Pentane, dodecafluoro-
 molecular dipole moments of, 6: 131(J)
- Pentane, 2,2,4-trimethyl-
 effect of I in radiolysis of, 6: 1674
- Pentoses
 determination of, by nitroprusside reactions, 6: 812
 ion exchange separation, 6: 148
- Peptides
 chromatographic determination of, in normal and x-irradiated egg yolks, 6: 508
 Peptides (cont'd.)
 hydrolysis of, by enzymes, 6: 150
 synthesis of modified, from aldonic acid, 6: 162
- Periodic systems
 (See also isotopes of the elements; also groups of elements, e.g., Transuranic elements.)
 based on electronic structure of atoms, 6: 114(J)
- Peroxides, perhaloacetyl
 preparation of, 6: 1567(P)
 storage of, 6: 1566(P)
- Pertechnetates
 absorption spectra of, 6: 1397(J)
- Perturbation theory
 (See also subheading perturbation under reactors.)
 quantum mechanical, note on, 6: 1695
- Phenol-sulfuric acid systems
 diffusion in, 6: 804
- Phosphatase activity
 alkaline, in Be poisoning, 6: 1616
- Phosphatases
 biosynthesis of, by lily anthers, 6: 3
 effects on calcification of bone, 6: 21(J)
- Phosphate deposits (uraniferous)
 exploration of, in Morocco, 6: 1461(J)
- Phosphate rock
 processing of, for recovery of P and V, 6: 1727
- Phosphatides
 biosynthesis of, by rats, 6: 798(J)
 incorporation of phosphate into, by liver slices, 6: 799(J)
- Phosphinic acid, ethyl-(p-hydroxyphenyl)-
 preparation of, 6: 93
- Phosphinic acid, ethyl-(p-toluenesulfonyloxyphenyl)-
 preparation of, 6: 93
- Phosphorescence
 (See also as subheading under specific materials; see also Fluorescence; Luminescence; Phosphors.)
 induced by α particles or γ -radiation, 6: 653(R)
 quantum-mechanical theory of, 6: 1363(J)
- Phosphors
 (See also specific phosphorescent compounds; see also Luminescence; Phosphorescence.)
 application of, to detection of infrared radiation, 6: 1510
 effects of α and γ rays on conductivity and fluorescence of, 6: 1392(R)
 gamma induced fluorescence and phosphorescence in various inorganic 6: 1749(R)
 luminescence of, 6: 1506(R)
 properties of, 6: 59(R)
 radioinduced electric conductivity of, 6: 1749(R)
 scintillation efficiency of, in polystyrene solid solutions, 6: 1509
 techniques in using, for x radiation detection, 6: 403(R)
- Phosphorus
 incorporation of, into lipides of liver slices, 6: 799(J)
 plant metabolism of, effect of stunting agents on, 6: 530
 ratio of, to C in photosynthesis intermediates, 6: 168
 recovery of, from phosphate rock, 6: 1727
 spectrographic determination of, in organic solids, 6: 158
 tissue distribution of, in *Drosophila*, 6: 1595
 tissue distribution of, in pigs, 6: 796(J)
 uptake of, by erythrocytes, 6: 790
 uptake of, by ribonucleotides in liver-cell fractions, 6: 112(J)
- Phosphorus coatings
 on a mirror surface, 6: 1304(R)
- Phosphorus-iron-magnesium alloys
 corrosion of, effect of composition and heat-treatment on, 6: 228(R)
- Phosphorus isotopes
 mass defect of, 6: 1553
- Phosphorus isotopes P^{31}
 gamma reactions (γ, n), 6: 1871(J)
 proton reactions (p, α), 6: 1533
- Phosphorus isotopes P^{32}
 adsorption and assimilation of, by bacterial slimes, 6: 789(R)
 beta spectra of, 6: 954(R)
 blackening of photographic plates by β particles from, 6: 1287
 bremsstrahlung from, angular correlation and intensity of, 6: 1047(J)
 concentration of, in hospital wastes, 6: 519(J)
 determination of, in plants, 6: 968(J)
 isotopic exchange reactions of, with organic P compounds, 6: 802
 neutrino emission from, 6: 1909
 physiological effects on epidermal cells, 6: 797(J)
 preparation of intense sources of, 6: 633(J)
 radioautographic uses, 6: 795(J)
 removal of, from water supplies, 6: 515

- Phosphoryl fluorides
microwave spectra and structure of, 6: 1165
- Photofission products
angular distribution of, 6: 1393(R)
- Photographic film
(See also Nuclear emulsions.)
in angular distribution measurements, 6: 1292(J)
application of, to beta spectra measurements, 6: 1560(J)
dental, for x-ray dosage measurements, 6: 1613(J)
effects of x rays on, 6: 730(J)
effects of x-rays and light on, 6: 1681(J)
fading of latent images produced by protons and α particles in, 6: 838(J)
neutron and proton charge-exchange reactions in, 6: 1881(J)
in observation and identification of electromagnetic processes occurring
in soft component of cosmic radiation, 6: 1765(J)
radiation sensitivity, calibration, and fogging of, 6: 295
response of, to β particles of graded maximum energies, 6: 964(J)
sensitivity of, for x-ray-diffraction studies, 6: 971(J)
- Photographic film detectors
(See also Nuclear emulsions.)
with polyvinyl-chloride films, 6: 660(J)
- Photometers
polarization, accuracy of, 6: 630(J)
- Photomicrography
techniques in observing tissue culture, 6: 797(J)
- Photomultiplier tubes
design and operating characteristics of, 6: 936(R)
effects of fatigue in, on scintillation counting results, 6: 665(J)
performance of, 6: 278(R)
spurious pulses from type 5819, 6: 1492
- Photoneutrons
effect of γ energy on yield of, 6: 1538
production of nonenergetic, using Be or D, 6: 1829
production of, thresholds for, 6: 706(J)
yields of, from Si and Mg isotopes, 6: 1874(J)
- Photons
(See also Gamma radiation; X-radiation.)
in cosmic radiation, absorption of, by various materials, 6: 258(J)
interactions of, with mesons and nucleons, 6: 1055(J)
nuclear reactions (γ, p) and (γ, n), in Al^{27} and Mg^{24} , Mg^{25} , Mg^{26} , 6: 1876(J)
scattering of, by nuclei, 6: 728(J)
- Photosynthesis
carbon in, path of, 6: 167
energy transfer methods in, 6: 567
oxidation-reduction potentials in, 6: 540
pH effects on, 6: 531
quantitative studies of, 6: 498
relation of, to respiration, 6: 75(J)
- Photosynthetic products
chromatographic analysis of, 6: 167
phosphorus-carbon ratios in, 6: 168
radioautographic analysis of, 6: 167
- Phthalic acid, dibutyl ester
atomization of, 6: 1439
- Phthalic anhydride
polarographic behavior of, 6: 806
- Phthalic anhydride, iodo-
polarographic behavior of, 6: 806
- Phycocyanin
occurrence in blue-green algae, 6: 14
- Physics
(See also Mathematics.)
Atomic Energy Commission research programs in, 6: 1487
- Physostigmine
effects on concentration of K in erythrocytes, 6: 791
- Picoline
electron energy levels of, 6: 1769
- Pigs
blood volume determinations in, 6: 504(R)
- Piles
(See Reactors.)
- Pions
(See Mesons (π).)
- Pipes
(Generally thick walled, large diameter; see also Tubes.)
clamp for extraction of vertical, from inaccessible locations, 6: 1571(P)
- Pitchblende
occurrence of, at Caribou Mine, Boulder County, Colorado, 6: 213
- Pitchblende ores
age estimations of, in Belgian Congo, 6: 220(J), 221(J)
diagnostic associates in Morocco, 6: 1460(J)
occurrence of, in Belgian Congo, 6: 222(J)
- Pittsburgh Univ.
progress reports, 6: 91(R), 235(R), 1472(R)
- Pituitary gland
effects of radiation on hormone production by, 6: 31
neoplasms of, induced by I^{131} , 6: 776(J)
- Placental tissues
radiosensitivity effects of mashed, 6: 763
- Plankton
(See also Algae.)
radioactivity of, in Columbia River, 6: 513
- Plant cells
alpha dosimetry in single, with scintillation counters, 6: 293
- Plant metabolism
effects of radiation on oxidative, in bacteria, 6: 1595
- Plants
(See also specific plants by name.)
biochemical effects of growth regulators on, 6: 1592
carbon dioxide metabolism by, as studied in barley roots, 6: 1703
chemical analysis of extracts of, by ion exchange, 6: 101
effects of chronic γ radiation on histology of, 6: 1595
phosphorus distribution in, effects of stunting agents on, 6: 530
- Plastic deformation
(See also as subheading under specific materials.)
in metals, x-ray microscopic study of, 6: 1250(J)
- Plastic film detectors
design of, 6: 1278(R)
preparation of, 6: 960(R)
- Plastics
(See also specific compounds used as plastics.)
corrosion of, by H_2O_2 , 6: 240(J)
effects of radiation on electronic processes in, 6: 835(J)
effects of radiation on nylon, 6: 493(J)
effects of radiation on paramagnetic resonance spectra of dyed and clear,
6: 834(J)
electron scattering cross sections of nylon, 6: 1037(J)
- Plates
heat emission by, in liquids and gases, 6: 1202(J)
- Platinum
electric conductivity of, effect of elastic deformation on, 6: 241(J)
tissue distribution of, in rabbits, 6: 63(J)
tissue distribution of, in rats, 6: 496(R)
- Platinum isotopes Pt^{191}
formation of, 6: 496(R)
- Platinum isotopes Pt^{193}
formation of, 6: 496(R)
- Platinum isotopes Pt^{195}
decay schemes of, 6: 1925(J)
- Platinum isotopes Pt^{196}
binding energy of, calculation, 6: 333(J)
- Platinum isotopes Pt^{197}
decay schemes of, 6: 1925(J)
- Plutonium
bone deposition of, 6: 1389
chelation of, 6: 496(R)
identification of, lecture on, 6: 1835
radiometric determination of, 6: 105
separation of, from Am and U, 6: 105
toxicology of, 6: 526(R)
- Plutonium isotopes Pu^{239}
alpha emission, measurement of, 6: 1481
conversion electrons from, 6: 1906
fission of, 6: 698
- Plutonium isotopes Pu^{240}
conversion electrons from, 6: 1906
- Plutonium isotopes Pu^{241}
beta spectra of, 6: 1906
- Pocket chambers
design of electrometers for, 6: 1581(P)
response of, to fast neutrons, 6: 1(R)
- Polarographic analysis
(See also as subheading under specific materials.)
equipment for, 6: 552(R)
micro H-cell for, design, 6: 1151(J)
theory of, 6: 1635
- Polarographs
design of high-sensitivity recording, 6: 1163
- Polarography
application of, to study of metal corrosion, 6: 1450(R)
- Pollen
oxygen-induced chromosomal aberrations in, 6: 4
x- and γ -ray induced chromosomal aberrations, 6: 27

- Polonium**
 toxicology of, 6: 526(R)
 x-ray spectra of, bibliography on, 6: 449
- Polonium isotopes Po^{210}**
 alpha emission, 6: 296(R)
 alpha particles from, pulse-height distribution of, 6: 296(R)
 decay schemes of, 6: 1628
 electron spectra of, 6: 954(R)
- Polonium isotopes Po^{211}**
 formation, half lives, energy levels, and alpha emission of, 6: 411
 genetic effects of α -radiation from, on fungi, 6: 1085
- Polonium isotopes Po^{212}**
 alpha emission from, 6: 438(J)
 nuclear energy levels of, 6: 1848(J)
- Polyenes, diphenyl-**
 scintillations in, 6: 961
- Procelain**
 (See also as products, e.g., Pipes.)
 thermal conductivity of, up to 1300°C, 6: 1448(R)
 thermal rupture of porous and non-porous, 6: 199
- Porous metals**
 machining of, 6: 1234
 permeability of, 6: 1196, 1232(R)
 sweat cooling of, 6: 1196, 1197
 sweat cooling in, protection achieved by, 6: 864
- Porphyrins**
 degradation of, method for, 6: 510(R)
- Positronium**
 annihilation and energy levels of, 6: 681(J)
 fine structure of, 6: 447, 1861
 formation of, in Freon 12, 6: 1771
 formation of triplet, in gases, 6: 1305
 production, quenching, and Zeeman effect in ortho-, 6: 1533
- Positrons**
 (See also Electrons.)
 absorption of, by Pb, 6: 395(J)
 annihilation half lives of, 6: 1839
 from $C^{12}(p,\gamma)N^3(\beta^+)$, 6: 1879(J)
 half lives of, in condensed materials, 6: 1910
 mass measurements of, 6: 995(J)
 scattering of, in A, 6: 401(J), 1899(J)
 scattering of, in nuclear emulsions, 6: 661(J)
 short-range interaction of negatrons with, 6: 1861
 three-photon annihilation of, 6: 1305, 1771
- Potassium**
 chromatographic separation of, from Rb and Cs, 6: 848(J)
 concentration of, in erythrocytes, 6: 791
 determination of, in Na metal, 6: 815
 effects on carbohydrate metabolism, 6: 758
 exchange of, from blood plasma with K of body tissues in rats, 6: 1110
 exchange rate of, in circulating blood of rabbit, 6: 1111
 exchange rate of, in rat erythrocytes, 6: 793
 heat of reaction of, with water at 25°, 6: 1132(J)
 infrared spectra of, calculations, 6: 161(J)
 metabolism of, in x-irradiated dogs, 6: 510(R)
 radiometric determination of, in urine, 6: 1116
 solubility of oxygen in, 6: 1237
 spectrographic determination of, in organic solids, 6: 158
- Potassium (liquid),**
 thermal conductivity of, measurement of, 6: 1444(J)
- Potassium borates**
 coloration of, 6: 142(J)
- Potassium bromide crystals**
 absorption bands in irradiated, 6: 1427
- Potassium chlorides**
 coloration and luminescence of, radiation-induced, 6: 142(J)
 thermodynamic properties of, 6: 560
- Potassium fluophosphates**
 infrared spectrum and crystal structure of, 6: 1667(J)
- Potassium fluorides**
 infrared spectrum of, 6: 1665(J)
- Potassium iodides**
 scintillation and luminescence of pure and Tl-activated, 6: 302(J)
- Potassium isotopes**
 spectra of, 6: 1750(R)
- Potassium isotopes K^{37}**
 beta spectra and half lives of, 6: 735
- Potassium isotopes K^{38}**
 gamma spectra, 6: 1351(J)
- Potassium isotopes K^{39}**
 mass of, 6: 991(J), 1284(J)
- Potassium isotopes K^{40}**
 radioactive decay of, 6: 369(J)
- Potassium isotopes K^{41}**
 mass of, 6: 991(J), 1284(J)
- Potassium isotopes K^{42}**
 decay of, β - γ angular correlations in, 6: 1843(J)
 formation of, by proton bombardment of Cu , 6: 700
- Potassium oxides**
 solubility of, in K, 6: 1237
- Potassium-sodium alloys**
 heats of formation of, at 25°, 6: 1127(J)
 solubility of oxygen in, 6: 1237
- Potassium-sodium alloys (liquid)**
 thermal conductivity of, at 200 to 815°C, 6: 232
- Potentiometers**
 multiple-range, for use with thermocouples, 6: 1496
- Powders**
 (See also by materials, e.g., Nickel powders; see also Particles.)
 surface-area measurement of, 6: 1426
- Power**
 (See Electric power, Nuclear power, and Power reactors.)
- Power reactors**
 (See also Nuclear power.)
 cycle analysis for, 6: 577
- Power supplies**
 (See also specific instruments and various components, e.g., electron tubes; see also Electric power; Rectifiers; Voltage regulators.)
 circuit for d-c high-voltage, f-m-regulated, 6: 1585(P)
 design of, 6: 59(R), 407(R), 1304(R)
 operating and technical manual on E.H.T. Unit - AEP 1007A (Canada), 6: 1494
 performance curves for, 6: 628
- Praseodymium**
 absorption spectra of, theory, 6: 1271(J)
 fractional-precipitation separation of, from La, 6: 1174(J)
- Praseodymium chlorides**
 absorption spectra of, 6: 1628
 activity coefficients, conductances, and transference numbers of, 6: 562
 activity coefficients of, in aqueous solutions, 6: 558
 transference numbers of, 6: 563
- Praseodymium compounds**
 absorption spectra of, 6: 1272(J)
 purification of, by ion exchange, 6: 559
- Praseodymium isotopes Pr^{140}**
 beta spectra and half lives of, 6: 735
- Praseodymium isotopes Pr^{143}**
 preparation of carrier-free, 6: 1422
- Praseodymium isotopes Pr^{144}**
 internal conversion in, 6: 1919(J)
- Praseodymium oxide-cerium oxide systems**
 reduction of, by H_2 , 6: 1683(J)
- Praseodymium oxides**
 heat content, specific heat, and entropy of, 6: 147(J)
- Praseodymium peroxides**
 preparation and identification of, 6: 1684(J)
- Pressure drop**
 (See also Air flow.)
 measurement of, in glass spheres, 6: 1441(R)
- Pressure gages**
 (See also Manometers; Vacuum gages.)
 design of oscillation type, 6: 484(P)
- Princeton Univ.**
 progress reports, 6: 90(R)
- Promethium**
 bone deposition of, 6: 1389
- Promethium isotopes**
 decay schemes of, 6: 1907, 1927
- Promethium isotopes Pm^{141}**
 identification of, 6: 1927
- Promethium isotopes Pm^{142}**
 limits on half lives of, 6: 1927
- Promethium isotopes Pm^{143}**
 decay schemes of, 6: 1927
- Promethium isotopes Pm^{144}**
 decay schemes of, 6: 1927
- Promethium isotopes Pm^{146}**
 identification of, 6: 1927
- Promethium isotopes Pm^{148}**
 half lives of, 6: 1927
- Promethium isotopes Pm^{150}**
 identification of, 6: 1927

- Promethium isotopes Pm^{151}
half lives, 6: 1424(R)
- Propane (labeled)
preparation of, 6: 551
- 2-Propanol
mass spectra of, 6: 1628
- 2-Propanol (labeled)
mass spectra of, 6: 1628
preparation of, 6: 551
- 1-Propanol, 2,3-dimercapto-
radiosensitivity effects of, 6: 46
- 2-Propanone, 1,3-dihydroxy-(labeled)
synthesis of, 6: 571(J)
- Propionates
metabolism of, by *Propionibacterium pentosaceum*, 6: 1697
- Propionic acid
ionization of, in dioxane-water solutions, 6: 1631
oxidative reactions in fermentation of, 6: 1070(J)
- Propionic acid, α -bromo-
polarographic behavior of, 6: 538
- Propionic acid, formyl-
reduction of, by Wolff-Kishner method, 6: 178(J)
- Proportional detectors
for alpha detection in large samples, 6: 959
application of, to determination of decay scheme of I^{131} , 6: 1922(J)
design and performance of, 6: 645
design, performance, and operation of BF_3 filled, 6: 1812(J)
effect of negative ions on, 6: 1533
efficiency of, 6: 409
energy loss of electrons in, 6: 393(J)
in measuring intensities of diffracted x rays, 6: 1291(J)
performance of 4π , in β counting, 6: 277(R)
for soft β and x radiation, 6: 309(J)
for thermal neutron surveying, 6: 1288
- Propyldisulfide, perfluoro-
preparation, physical properties, and infrared spectra of, 6: 129(J)
- Propyltrisulfide, perfluoro-
preparation, physical properties, and infrared spectra of, 6: 129(J)
- Propyne, 3,3,3-trifluoro-
molecular structure of, 6: 554(J)
synthesis and infrared spectra of, 6: 553(J)
- Protactinium isotopes
rapid separation methods for, from cyclotron bombarded $\text{Th}(\text{NO}_3)_4$, 6: 1685
- Protactinium isotopes Pa^{231}
nuclear properties of, 6: 1928
- Protactinium isotopes Pa^{234}
half lives and ion exchange separation of, 6: 437(J)
- Proteins
chromatographic analysis for, in *Drosophila*, 6: 767(J)
- Proton cross sections
(See also the subheadings proton cross sections and proton reactions
under specific materials.)
theory of, 6: 686
- Proton scattering cross sections
of bromine, C, N, O, and Ag, 6: 1546
measurement of, by magnetic deflection method, 6: 1029
theory of, 6: 1551(J)
- Proton spectra
measurement and calculation of, 6: 388
- Protons
(See also Cosmic protons.)
angular distribution of, in the photodisintegration of deuterons, 6: 1539(J)
from $\text{C}(\gamma, p)$ reactions, 6: 701
cross sections for electron capture and loss by, passing through air, 6: 1905(J)
from $\text{D}(n, p)$, angular distribution of, 6: 361
electromagnetic interference effects in charged π -p scattering, 6: 1514
from fission of U^{235} , energy distribution of, 6: 698
from $\text{H}^2(d, p)$, angular distribution of, 6: 1330(J)
impulse approximation for scattering of, by deuterons, 6: 1896(J)
interactions of, with neutrons, 6: 386, 1346(J)
interactions of, with protons, 6: 385
interactions of photons with, in H_2 high-pressure chamber, 6: 1393(R)
ionization ranges of, in H_2 and O_2 gas, 6: 1339
from $\text{Li}^6(d, p)$, angular distribution of, 6: 710(J)
long-range interactions of, with protons, 6: 336
mass changes of, in p-p scattering, 6: 1893(J)
mass of, from $\text{T}(p, n)\text{He}^3$, 6: 1859
multiple coulomb scattering of, in nuclear emulsions, 6: 1550(J)
- Protons (cont'd.)
nuclear reactions of, bremsstrahlung from, 6: 337
polarization and scattering of, by He, 6: 1887
polarization of, by double scattering, 6: 1900(J)
proton reactions ($p, d\pi^+$), theory, 6: 328(J)
range-energy relation in air and Al, 6: 1345(J)
range-energy relation in nuclear emulsions, 6: 391(J), 399(J)
range of 18-Mev, in Al, 6: 1901(J)
range straggling of, 6: 1897(J)
response of scintillation crystals to, 6: 966(J)
scattering of, by He, 6: 1040(J)
scattering of, by meson fields, theory, 6: 1042(J)
scattering of, in nuclear emulsions, 6: 391(J)
scattering of, by nuclei, 6: 389
scattering of, by protons, 6: 385
scattering of, by protons or neutrons, 6: 1894(J)
scattering of, theory, 6: 724(J)
scattering of neutrons by, 6: 387
scattering of neutrons by, theory, 6: 1043(J)
star production by, in nuclear emulsions, 6: 1534
anomalous magnetic moment of, theory, 6: 1054(J)
from 270-Mev neutron-deuteron collisions, 6: 716
yields of, from γ radiation on Si and Mg isotopes, 6: 1874(J)
- Protons (negative)
probability of formation of, from V^0 particles, 6: 1488
- Puerto Rico Univ.
progress reports, 6: 610(R)
- Pulse analyzers
(See also Oscillographs.)
calibration of, 6: 407(R)
calibrator unit for, 6: 629
design of, 6: 632(J), 634(J) 962(R)
design of coincidence, 6: 1499
review of types employed in nuclear research and their performance, 6: 1797
testing of, 6: 936(R)
- Pulse generators
design of, 6: 277(R), 483(P)
for discriminator calibration, 6: 629
for music range, 6: 943(J)
photographs and drawings of, 6: 941
- Pulse modifiers
design of, 6: 486(P)
photographs and drawings of, 6: 941
- Pumice
as an aggregate for light weight structural concrete, 6: 1206
- Purines
metabolism of, in the presence and absence of folic acid, 6: 1112
- Pyridine
electron energy levels of, 6: 1769
- Pyridine, 4-carboxymethyl-2-phenyl-
synthesis of, 6: 91(R)
- Pyridoxine
protective action of, against toxic effects of P^{32} , 6: 1081
- Pyrite
absorption of xanthate on, 6: 251(R)
flotation of, tracer studies of, 6: 251(R)
- Pyrometers
(See also Thermocouples.)
window shield for, for use in vacuum melting operations, 6: 1445
- Pyruvates
biosynthesis of, by fungus, 6: 532(J)
oxidation of, in mitochondria, 6: 760
metabolism of, in rat liver
- Pyruvic acid
polarographic behavior of, 6: 1635
reduction of, by Wolff-Kishner method, 6: 178(J)
- Pyruvic acid (labeled)
synthesis of, 6: 1179(J)
- Pyruvonnitrile
hydrolysis of, in aqueous concentrated HCl and in an ethereal medium, 6: 1179(J)
- Quantum electrodynamics
charge renormalization accompanying radiative corrections in, 6: 1362(J)
conservation laws in, 6: 1932(J)
covariant auxiliary condition for, 6: 1056(J)
electromagnetic effects due to spin-orbit coupling, 6: 1838
energy density tensor in gauge-independent, 6: 1057(J)
formulation of, 6: 453(J)

Quantum electrodynamics (cont'd.)

- gauge-independent, 6: 744(J)
- interaction of spinning particle with field, 6: 1933(J)
- many-electron problem in solids, 6: 754(J)
- meson theories, 6: 746(J)
- multiple boson processes, 6: 745(J)
- normalization group in, 6: 458(J)
- quantization of Dirac's new classical theory, 6: 1939(J), 1940(J)
- radiation corrections in, 6: 455(J)
- radiation from an electron in a magnetic field, 6: 918, 933(J)
- radiation reaction in relativistic motion of a particle in a wave field, 6: 1935(J)
- relativistic equation for bound-state problems, 6: 1937(J)
- reversibility of, 6: 1058(J)
- theory of electrons, 6: 621(J)
- theory of Lamb shift and anomalous magnetic moments, 6: 1054(J)
- threshold for particle creation in, 6: 1942(J)
- unitary transformation of Hamiltonian for free Dirac particle, 6: 292

Quantum mechanics

(See also Mathematics.)

- books on, 6: 749
- boundary conditions and time-dependent states, 6: 682(J)
- equations of motion and conservation theorems, derivations of, 6: 637(J)
- in Fock space, 6: 683(J)
- forced harmonic oscillation in, 6: 1370(J)
- of hydrogen atom, 6: 1060(J)
- invariant forms of 4 Dirac wave functions, 6: 1062(J)
- perturbation theory in, 6: 1502(J)
- of phosphorescence, 6: 1363(J)
- relation of, to classical mechanics, 6: 1938(J)
- relation of, to deterministic theories, 6: 1367(J)
- relativistic theory of spin, 6: 457(J)
- scattering of quanta by electrons, 6: 1034(J)
- solutions for Schroedinger equation of 2-electron atoms, 6: 1063(J)
- in study of electronic energy of lithium hydride, 6: 1303(J)
- theory of particles of arbitrary spin, 6: 1059(J)
- wave functions in momentum space, 6: 1936(J)

Quartz

(See also Silicon oxides.)

- absorptive properties, 6: 251(R)

Quenching circuits

- design of, for parallel-plate counters, 6: 942(J)

Quinhydrone

- polarographic behavior of, 6: 1638

Quinoline, 4-methyl-, 2-phenyl-

- synthesis of, 6: 91(R)

Quinoline oxalate

- formation of radioactive naphthalene and other compounds from, by Szilard-Chalmers reactions, 6: 1167(J)

8-Quinolinol chelates

- chemical stability of, 6: 1632

8-Quinolinol, 2-methyl-

- complexes of, with Co, Cu, Mg, Mo, Ni, Tl, V, and Zn, 6: 1141(J)

Radiation

(For specific radiation see also direct headings; e.g., Alpha particles; Beta particles, etc.; see also Accelerators; Nuclear reactions; Radiation detection instruments.)

- angular correlation functions of, asymptotic behavior of, 6: 350(J)
- angular distribution, use of photographic densitometry for measurement of, 6: 1292(J)
- biological effects of, 6: 53(J), 1095
- biological effects of, permissible limits for, psychological factors induced by fear of, 6: 1376
- chain mechanism of damage by, 6: 768(J)
- color-center production in borosilicate glass by, 6: 1419(J)
- cytological effects on invertebrates, 6: 1381(J)
- detection and measurement, 6: 1(R)
- dosage determinations of, from metabolized isotopes, 6: 501(R)
- dosage determinations of, in treatment of skin diseases, 6: 64(J)
- dosage determinations of, in a water phantom, 6: 680(R)
- effects on eyes of rabbits, 6: 505
- effects on lipoprotein metabolism, 6: 38
- effects on mortality rate of rabbits fed tapioca dextrin, 6: 1617
- effects on small intestine, 6: 35
- effects on sulfhydryl content of blood plasma, 6: 1593
- from Ga⁷², physiological effects of, 6: 527
- genetic effects in bacteria, 6: 1086
- genetic effects on maize seed, 6: 774(J)
- genetic effects on paramecia, 6: 140

Radiation (cont'd.)

- health physics aspects of, 6: 781
- hematological effects of, 6: 1598
- histological effects on plants and rats, 6: 1595
- indirect effects on blood vessels, 6: 1600
- interaction with matter in the region of optical resonance, 6: 1361(J)
- lethal effects of, influence of blood dialysis on, 6: 1378
- lethal effects on cells, 6: 771(J)
- multiple scattering of, theory, 6: 383
- permissible limits of, lecture on, 6: 1095
- physiological effects on rats, 6: 1595
- quantum theory of scattering of, 6: 1039(J)
- scattering of, in a central field, 6: 727(J)
- scattering of, by electrons, 6: 1034(J)
- scattering of, in a magnetic field, 6: 1041(J)
- scattering of, by metal foils, 6: 398(J)
- scattering phases of, upper and lower bounds of, 6: 719(J)

Radiation chemistry

(Covering chemical reactions and changes in chemical properties brought about by radiations; see also the property concerned and reactions under the element or material affected by the radiation; see also Radiochemistry.)

- bibliographies on utilization of fission products, 6: 916(R)
- review of development, application, possible uses of, 6: 833(J)

Radiation detection instruments

(A complete instrument, not necessarily including the radiation detector component; classified in the subheadings below according to the type of signal received from the detector component; see also Counting devices; Radiation detectors; Radiological telemetering systems.)

- calibration checking device for, 6: 662(J)
- colorimetric, for γ radiation, 6: 660(J)
- conference on, 6: 631(J)
- for counting CO₂, 6: 663(J)
- for counting random pulses, 6: 303(J)
- ion current type, 6: 638(R), 650(R), 1506(R), 1802(R)
- monitor and x-ray yield integrator for betatron, 6: 1799
- portable, for β and γ radiation, 6: 313(J)
- pulse type, 6: 303(J)
- pulse type, calibration of, 6: 667(J)
- pulse type, discharge mechanism in, 6: 658(J)
- pulse type, for liquid samples, 6: 659(J)
- review of, 6: 305(J)
- self quenching in, 6: 970(J)

Radiation detectors

(For specific radiation detectors, sometimes called counters, see also the main headings listed below; see also Radiation detection instruments; Cloud chambers; Crystal detectors; Geiger-Mueller tubes; Ionization chambers; Photographic film detectors; Photomultiplier tubes; Pocket chambers; Proportional detectors; Scintillation detectors.)

- alpha-particle bench monitor, design, 6: 1805(J)
- for health physics, lecture on, 6: 781
- statistical analysis of, 6: 640(R)

Radiation injuries

(See also as subheading under organisms, organs, etc.; see also Radiation sickness.)

- accidentally produced during therapy, 6: 42(J)
- caused by atomic bombs, review of types and treatments of, 6: 52(J)
- chemical prophylaxis of, 6: 23, 46, 47, 48, 49, 50, 51(J), 53(J), 520(R)
- chemical prophylaxis of, with cysteine, 6: 1379(R), 1608
- effects of adrenalectomy on, 6: 507
- prophylaxis of, with injected bone marrow, 6: 57(J)
- prophylaxis of, review of biological and pharmacological agents for, 6: 1380
- produced by synergistic action of radioisotopes, 6: 33
- therapeutic effects of injected lymphocytes in, 6: 1612
- therapy of, blood dialysis in, 6: 1378

Radiation Lab., Univ. of Calif.

- progress reports, 6: 962(R), 1821(R)
- progress reports, medical and health physics, 6: 495(R)

Radiation protection

(General aspects of the problem concerning personnel; see also Health physics; Radiation detection instruments.)

- of x-ray technicians in hospitals, 6: 1096(J)

Radiation sickness

(See also the subheading biological effects under Radiation and under the specific radiations; see also physiological headings, e.g., Anemia, Blood picture, Skin, etc.; see also Radiation injuries.)

- symptoms, pathology and treatment of, 6: 1097
- symptoms and treatment of, caused by atomic bomb explosions, 6: 1588(J)

- Radiation sickness (cont'd.)
 therapy of, with ACTH, 6: 58(J)
 therapy of, with antibiotics, 6: 784
 therapy of, with aureomycin and whole blood, 6: 516(R)
 therapy of, with Vitamin B₁₂, 6: 55(J)
- Radiation sources
 geometry of, 6: 650(R)
- Radiation target cans
 design and welding of, 6: 423(J)
- Radiation target theory (biology)
 as applied to the inactivation of catalases by fast deuterons, 6: 1602(J)
- Radiation targets
 assembly for irradiation of solutions, 6: 496(R)
 preparation of, for producing radioisotopes, 6: 1584(P)
- Radiation targets (Li)
 preparation and storage of, 6: 536
- Radioactive contamination
 (See also subheading contamination under materials and units contaminated; see also Stack disposal; Waste disposal.)
 control of, lecture on, 6: 781
 of metal surfaces by ¹³¹I in solution, 6: 883
- Radioactive minerals
 aerial prospecting for, 6: 590(J)
 crystal structure destruction of, radioinduced, 6: 1225(J)
- Radioactive ores
 (See also specific radioactive ores by name, e.g., Uranium ores.)
 prospecting for, in the Soviet Union, 6: 216(J)
- Radioactive waters
 therapeutic uses of, 6: 524(J)
- Radioactivity
 (See also as subheading under specific isotopes and elements; also the subheading radioactivity induced in; see also subheading for specific radiations emitted, e.g., gamma emission; see also main headings for radiations and particles, e.g., Alpha particles, and Gamma radiation.)
 maximum permissible limits of, in air, 6: 1611
 nomograms for calculating, of fission products, 6: 406
 in snow on Puy de Dome, France, 6: 1358(J)
- Radioapplicators
 comparison of, for β particles, 6: 304(J)
 design of, 6: 525(J)
 design and performance of, 6: 504(R)
 preparation of radioactive glass beads as, 6: 625(R)
 thin-walled glass needles as, 6: 633(J)
- Radioautographic analysis
 (See also as subheading under specific materials.)
 of thorium- and U-containing materials, 6: 1809(J)
- Radioautography
 (Photographic processes involving the use of radiations from emitters incorporated with a material; e.g., tissue containing C¹⁴, etc.; see also Radioautographic analysis; Radiography.), 6: 61(J)
 gamma-ray pinhole camera for use in, 6: 521
 measurement of nucleic acids by, 6: 149
 with phosphorus P³² and S³⁵ in plants, 6: 795(J)
 techniques using At and I simultaneously, 6: 496(R)
 tritium in, 6: 61(J)
- Radiochemical processing plants
 instrument needs of, 6: 1705
- Radiochemistry
 (Covering general theory and experimental techniques of the chemistry of radioactive materials.)
 history of, with emphasis on Otto Hahn's discoveries, 6: 1675(J)
- Radiography
 (Photographic processes involving the use of α and gamma radiations from external sources; see also Radioautography; Radiographic analysis.)
 depth determinations by x-ray photography, 6: 522(J)
 electron, theory and applications of, 6: 1778
 elimination of alignment errors in, 6: 62
 materials and methods for, 6: 477(P)
- Radioisotopes
 determination of tracers in presence of their daughters, 6: 1432
 measurement and handling of, for therapeutic uses, 6: 525(J)
 measurement of nuclear properties of, by microwave spectroscopy, 6: 1928
 metabolism and excretion of, 6: 501(R)
 physical, chemical and industrial applications of, 6: 305(J)
 production of, review of methods, 6: 1853
 production of, in Zee reactor, 6: 1325(J)
 review of applications of, in biochemical studies, 6: 73
 spectrographic analysis of, 6: 443
- Radioisotopes (cont'd.)
 synergistic lethal action of, in mice, 6: 33
 target arrangement for production of, 6: 1584(P)
 tracer techniques using, applied to tissue culture, 6: 797(J)
- Radiological defense
 medical aspects of, 6: 1587(J), 1588(J)
- Radiological telemetering systems
 design of f-m audio oscillators for, 6: 1783
- Radiological warfare
 effects on government and legal systems, 6: 1065(J)
 medical aspects of, lecture on, 6: 1376
 military aspects of, 6: 1587(J)
- Radiology
 history of standardization in, 6: 1098(J)
- Radiometric analysis
 (See also as subheading under specific materials.)
 sample preparation for, 6: 512(J), 965(J), 968(J)
- Radiosensitivity
 effects of temperature on, 6: 44(J)
- Radiotherapy
 (See also as subheading under conditions treated; see also subheadings biological effects under specific radiations, and therapeutic uses under specific radioactive isotopes.)
 using Co⁶⁰ source, 6: 1102(J)
 comparison of β -ray applicators, 6: 304(J)
- Radium
 alpha spectra of, 6: 428(J)
 decay schemes of, 6: 444(R)
 effects of injected, on alkaline phosphatase activity, 6: 28
 effects on excretion and white blood count, 6: 775(J)
 occurrence of, in municipal water supplies, 6: 510(R)
 tissue distribution, pathological effects, and therapeutic uses of, 6: 63(J)
 toxicology of, 6: 526(R), 787
- Radium isotopes Ra²²⁶
 formation and decay schemes of, 6: 284
- Radon
 biological effects of, as compared to α radiation, 6: 763
 dosage determinations of, and tissue distribution of decay products from, 6: 1607(J)
 gamma spectra of, 6: 446(R)
 measurement of, in breath, 6: 1802(R)
- Radon isotopes Rn²²⁰
 binding energy of, calculation, 6: 333(J)
- Radon isotopes Rn²²²
 half lives of, measured by differential ionization method, 6: 1357(J)
- Rare earth chlorides
 activity coefficients of, in aqueous solutions, 6: 558
 transference numbers of, 6: 563
- Rare earth isotopes
 alpha emission from, 6: 1556
- Rare earth oxychlorides
 thermodynamic properties and crystal energy of, 6: 1753
- Rare earth vanadates
 crystal structure of, 6: 1409(J)
- Rare earths
 alpha emission from, 6: 412
 determination of, by pile activation, 6: 549(J)
 fractional-precipitation separation of, 6: 1174(J)
 ion exchange separation of, theory, 6: 561, 1690(J)
 preparation of, by calcium reduction of chlorides, 6: 1171
 preparation and purification of, 6: 1464
 separation of, 6: 842(J)
- Rare gases
 (See also the specific elements in the group.)
 ion drift velocities in, 6: 931(J)
 molecular ion formation in, 6: 931(J)
 molecular ions in, mass spectrographic studies of, 6: 947(J)
- Rate meters
 (Integration of the pulses takes place in the circuit; for instruments integrating the pulses in the detector component see Radiation detection instruments—ion current type.)
 design of, 6: 1(R), 1802(R)
- Rats
 quarters for, criteria for air conditioning, 6: 1373
 urinary excretion of, effect of saline and pituitary hormone on, 6: 1622(J), 1623(J)
- RCA Victor Div., Radio Corp. of America
 progress reports on ionization chambers, 6: 638(R), 648(R), 649(R), 650(R), 651(R), 652(R)

SUBJECT INDEX

- RCA Labs. Div., Radio Corp. of America
progress reports, 6: 935(R)
- Reaction kinetics
spectrophotometric determination of rate constants, 6: 79
temperature variation of equilibrium constants, nomographs, 6: 254
- Reaction mechanisms (organic)
(Including kinetics, rate studies, rearrangements, etc.; see also Hydrogenation; Oxidation; Organic syntheses, etc.; and specific compounds.)
ascorbic acid oxidation in presence of thyroxine and derivatives, 6: 80
- Reactor experimental facilities
high-temperature furnace for use in nuclear reactors, design, 6: 1316
- Reactor materials
(See subheadings design; materials; shielding; etc., under specific reactors; also specific materials of use in reactors, e.g., Graphite; Beryllium; etc.; and the general headings Reactor moderators, etc.)
factors in selection of, lecture on, 6: 1189
properties required of, review, 6: 1315
radioactivity induced in, by a neutron flux, 6: 1908
- Reactor moderators
(See also subheading moderators under specific reactors; see also Graphite moderated reactors; Heavy water reactors; Reactor materials.)
properties of materials for, review, 6: 1315
- Reactor safety
(See also subheading safety under specific reactors; see also Criticality studies; Reactors—criticality studies.)
hazards and safety characteristics of reactors, 6: 1322
- Reactor shielding
(See also the subheading shielding under specific reactors.)
design of, lecture on, 6: 1360
elastomeric materials for, 6: 443
- Reactor simulators
(See also characteristic or component simulated under specific reactors and Reactors; see also Computers.)
design of, to assist in design of control system for NRU reactor, 6: 1802(R)
- Reactor tubes
(See also tubes as subheading under specific reactors.)
size of, for a specified heat transfer and flow friction performance, 6: 1709
- Reactors
(See also specific reactors.)
AEC program for, lecture on, 6: 1318
chemical and engineering problems in the development of, lecture on, 6: 1320
construction of first, at Univ. of Chicago, 6: 353
criticality studies for, 6: 354
group theory, 6: 952, 1000, 1319
hazards of low power research, lecture on, 6: 1322
heat transfer in, lecture on, 6: 1201
instrumentation and control for, lecture on, 6: 1321
multi-group calculations for, test of, 6: 695
multi-group equations for, numerical integration of, 6: 694
neutron flux distribution, influence of cylindrical channel on, 6: 332
neutron flux measurements in, ionization chambers for, 6: 666(J)
reactivity of, measurement, 6: 1527
survey of types, 6: 1323
theory, lecture on, 6: 1319
- Recoil ions
energy loss of, in tissue, 6: 34
- Rectifiers
(Crystal, copper oxide, mechanical; see also Electron tubes; Power supplies.)
design of, 6: 488(P)
- Red Desert Region
airborne radioactivity survey of, 6: 589
- Refractory materials
(See also specific materials; see also Ceramic materials.)
corrosion of, by liquid Bi, 6: 900
for high-temperature use in aircraft, 6: 200
spectrographic analysis of, carbon effect in, 6: 160(J)
thermal conductivity of, at high temperatures, 6: 578
- Reproduction
effects of radiation on, in rabbits, 6: 504(R)
- Reptiles
effects of x radiation on hematopoietic system, life span, and reproductive system of, 6: 1090(J)
- Research Lab. of Electronics, Mass. Inst. of Tech.
progress reports, 6: 1750(R)
- Resins
(See also Plastics.)
evaluation of, for decontamination of H₂O, 6: 830(R)
- Resistance furnaces
design of, 6: 236(R)
for study of in-pile gas-solid reactions, 6: 135
- Resistance thermometers
design and performance of, 6: 1780
- Resonators
electromagnetic, design and use for testing dielectric properties of titania ceramic, 6: 1493
- Respiration
effects of x radiation on, in bacteria, 6: 1079
- Reticulo-endothelial system
effects of radiation on, 6: 33
- Rhenium
neutron resonance cross sections of, 6: 1304(R)
- Rhodium
deuteron range-energy relation in, 6: 1032(J)
tissue distribution of, in rats, 6: 496(R)
x-ray spectra, 6: 97(J)
- Rhodium isotopes
yield of, from U fission, 6: 1424(R)
- Rhodium isotopes Rh¹⁰⁴
gamma spectra of, 6: 1923(J)
isomeric transition of, 6: 409
- Rhodium isotopes Rh¹⁰⁶
gamma emission from, polarization and angular correlation of, 6: 430(J)
- Ribonucleic acid, desoxy-
separation of, from pneumococcus type VI, 6: 762
- Ribonucleic acids
enzymatic degradation products of, 6: 1172
separation of, from pneumococcus type VI, 6: 762
- Robineau Claims (Colorado)
torbernite occurrence at, 6: 214
- Rockets
propulsion of, application of nuclear power to, 6: 1066
- Rocks
radioactive decay rate and age estimations of, 6: 425(J)
ratio of O isotopes in, 6: 1744(J)
- Roots
growth of, effects of radiation on, 6: 39(J)
radiosensitivity of, effects of temperature on, 6: 44(J)
- Rubber
(Specific elastomers, e.g., hevea, are indexed as organic compounds; see also Plastics.)
corrosion of, by H₂O₂, 6: 240(J)
thermo-osmosis of gases through, 6: 1776(J)
- Rubidium
chromatographic separation of, from K and Cs, 6: 848(J)
natural radioactivity of, 6: 1559(J)
x-ray spectra, 6: 97(J)
- Rubidium borates
coloration of, 6: 142(J)
- Rubidium isotopes Rb⁸⁶
decay of, β - γ angular correlations in, 6: 1843(J)
nuclear properties of, 6: 1928
nuclear spin of, 6: 1909
- Rubidium isotopes Rb⁸⁷
gamma (γ , α) cross sections, 6: 1012(J)
gamma reactions (γ , α), 6: 1871(J)
half lives of, 6: 1355(J)
- Rubidium isotopes Rb⁸⁸
beta emission and decay scheme of, 6: 1926(J)
- Ruthenium
oxidation-reduction states, 6: 1653
x-ray spectra, 6: 97(J)
- Ruthenium complexes
spectrophotometric analysis of, 6: 539, 1653
with thiourea, formation and properties of, 6: 1119
- Ruthenium isotopes Ru¹⁰⁵
preparation of carrier-free, 6: 1422
- Rutile
thermal capacity of CH₄ adsorbed on, 6: 868
- Rutin
adrenal-stimulating effect of, 6: 15(J)
- Safety
(General handbooks, rules, and regulations.)
handbooks of, used at AERE, 6: 514

- Saint Louis Univ.
progress reports, 6: 954(R)
- Samarium chlorides
activity coefficients of, in aqueous solutions, 6: 558
transference numbers of, 6: 563
- Samarium isotopes
decay schemes of, 6: 1907
- Samarium isotopes Sm^{151}
beta spectra and photon emission of, 6: 1906
- Sarcomas
(See also specific sarcomas, organs, tissues, animals, etc.; see also Carcinomas.)
regression of, synergistic effects of simultaneous systemic and local x radiation on, 6: 1082
- Scalars
counting losses in, calculation of, 6: 314(J)
design of four-tube decade, 6: 1815(J)
design and operation of type 1070A (British), 6: 1505
design of, using cold-cathode thyratrons, 6: 1779
- Scandium
chemical determination of small concentrations of, 6: 824(J)
- Scandium isotopes
decay schemes of, 6: 1907
- Scandium isotopes Sc^{45}
mass of, 6: 991(J)
nuclear magnetic moments of, 6: 1849(J)
- Scandium isotopes Sc^{46}
gamma-gamma angular correlation in, 6: 1913(J)
isomeric transition in, 6: 1046
- Scintillation detectors
(See also Crystal detectors.)
for air monitoring, 6: 1278(R)
for alpha dosimetry in single biological cells, 6: 293
decay time, pulse heights, and fluorescence spectra of organic, 6: 1424(R)
design of, 6: 59(R), 640(R), 1506(R)
effective resolution of, method for increasing, 6: 1801
effects of α and γ rays on conductivity and fluorescence of, 6: 1392(R)
effects of fatigue in photomultipliers on results of, 6: 665(J)
for fast neutrons, 6: 641
for liquid or solid samples, 6: 521
liquid, detection of thermal neutrons by B dissolved in, 6: 1286
liquid, homogeneous counting of biological material with, 6: 294
liquid, mode of action and efficiency of, 6: 294
lithium iodide crystals as, 6: 1507
for measuring activity of biological samples, 6: 1813(J)
monitor and x-ray yield integrator for betatron, 6: 1799
operation of, 6: 446(R)
organic crystal, fluorescence of, 6: 306(J)
performance of, 6: 961, 1802(R)
pulse-equalizing circuit for use with, 6: 1798
response of, to charged particles, 6: 966(J)
techniques for electron and γ -ray spectroscopy with, 6: 307(J)
testing of, 6: 646
thallium-activated CaI_2 and CsI as, 6: 1806(J)
- Sclerosis
(See also Atherosclerosis; Multiple sclerosis.)
glomerulo, in diabetic patients, 6: 1074
- Seals and glands
(See also Vacuum seals.)
design and testing of gas seals for KAPL intermediate power breeder control rods, 6: 1707
- Seed
(See also specific plants.)
effects of radiation on, 6: 32
effects of x radiation and neutrons on, 6: 41(J)
- Selenium isotopes
decay schemes of, 6: 1907
- Selenium isotopes Se^{73}
decay schemes of, 6: 1050(J)
- Selenium isotopes Se^{77}
isomeric transition of, 6: 409
metastable state of, 6: 1909
- Selenium isotopes Se^{81}
yields of isomers of, from (d,p) reactions, 6: 1424(R)
- Selenium isotopes Se^{82}
deuteron (d,2n) cross sections, 6: 1015(J)
- Selenium-thorium alloys
metallography of, with polarized light, 6: 1228
- Semi-conductors
(See also specific materials.)
deuteron range-energy relation in, 6: 1032(J)
- Semi-conductors (cont'd.)
electrical fluctuations in, theory of, 6: 1788(J)
localized electronic states in bombarded, 6: 557(J)
secondary photoconductivity in, 6: 1045(J)
- Servomechanisms
proportional position controller, 6: 485(P)
- Servomechanisms Lab., Mass. Inst. of Tech.
progress reports, 6: 296(R), 407(R)
- Sewage
(See also Waste disposal.)
biochemical oxidation of, effect of radioactivity on, decontamination of, 6: 1747
- Sewage systems
concentration of I^{131} and P^{32} in, 6: 519(J)
contamination of, by I^{131} , 6: 883
contamination of, by P^{32} , 6: 789(R)
- Shales
fluorimetric analysis of, for U, 6: 1136
- Shielding materials
(See also specific materials.)
secondary gamma production in, 6: 1342
selection of, lecture on, 6: 1360
- Shinarump formation
occurrence of U in, 6: 891(R)
- Shock waves
effects on mechanically constrained mice, 6: 12
- Showers
(See Cosmic radiation—showers.)
- Silanes, fluororganic
preparation of, 6: 130(J)
- Silicates
artificial crystallization of, 6: 1429
polarographic analysis of, for Li, 6: 820(J)
synthesis of, substituting F^- for $(\text{OH})^-$, 6: 1429
- Silicon
deuteron range-energy relation in, 6: 1032(J)
infrared spectra of, calculations, 6: 161(J)
localized electronic states in bombarded, 6: 557(J)
- Silicon-aluminum alloys
grain refinement of, effect of various additions on, 6: 250(J)
- Silicon-aluminum-magnesium alloys
grain refinement of, effect of various additions on, 6: 250(J)
- Silicon-copper single crystals
plastic deformation of, 6: 1470(R)
- Silicon-iron alloys
crystal structure of, 6: 1155
- Silicon isotopes
mass defect of, 6: 1553
- Silicon isotopes Si^{27}
beta spectra and half lives of, 6: 735
- Silicon isotopes Si^{29}
gamma reactions (γ, p), 6: 1874(J)
nuclear magnetic moments of, 6: 994(J)
- Silicon isotopes Si^{30}
gamma emission of, from Al (α, p), 6: 1878(J)
gamma reactions (γ, p), 6: 1874(J)
- Silicon isotopes Si^{31}
beta spectra of, 6: 1553
- Silicon oxide films
preparation of, for windows for gaseous radiation targets, 6: 955
- Silicon oxides
(See also Quartz.)
production of, by chloride decomposition, 6: 1944(P)
- Silicon-zirconium alloys
constitution diagrams of, 6: 591(R)
- Silicone coatings
preparation of, for high temperature use, 6: 885
- Silicones
corrosion of, by H_2O_2 , 6: 240(J)
thermodynamic properties of, 6: 127(J)
- Silicones (polymerized)
preparation of, for high temperature coatings, 6: 885
- Silver
corrosion rate of, in ferric perchlorate, 6: 889, 1468
creep of, at 200°C, 6: 603(R)
deuteron range-energy relation in, 6: 1032(J)
electric conductivity of, effect of elastic deformation on, 6: 241(J)
electron scattering by, 6: 1035(J)
hyperfine structure of, 6: 1793
neutron and proton charge-exchange reactions in, 6: 1881(J)
photoelectron emission from, 6: 1295(J)
proton scattering cross sections of, 6: 1546

- Silver (cont'd.)
wettability of, by glasses, 6: 201(R)
x-ray spectra, 6: 97(J)
- Silver-aluminum alloys
fatigue mechanism in, 6: 1248(J)
- Silver bromides
preparation of, 6: 89
- Silver chloride crystals
nuclear interaction of cosmic rays in, 6: 1760(J)
- Silver chlorides
preparation of, 6: 89
- Silver-gold alloys
diffusion in, 6: 603(R)
- Silver-gold couples
porosity of, metallographic studies on, 6: 1474
- Silver isotopes Ag^{109}
isomeric transition of, 6: 409
- Silver isotopes Ag^{110}
gamma spectra of, 6: 421(J)
- Silver isotopes Ag^{111}
yield of, from proton-induced fission of U, 6: 1856
- Silver-palladium couples
porosity of, metallographic studies on, 6: 1474
- Silver single crystals
sintering of, 6: 603(R)
- Single crystals
(See also by name of materials, e.g., Copper single crystals.)
apparatus for preparation of, 6: 1156(J)
crystallographic aspects of slip in body-centered cubic, theory of, 6: 1154
electron energy levels in, 6: 1272(J)
neutron-diffraction analysis of, 6: 721(J)
nuclear quadrupole spectra of, 6: 344(J)
plastic deformation of, 6: 1470(R)
ratios of critical shear stresses in mathematical analysis, 6: 1155
reflection of neutrons from, 6: 493(J)
structure determination of, from neutron diffraction data, 6: 619(J)
x-ray-diffraction analysis of, 6: 617
- Sintering
(See also as subheading under materials.)
bibliographies on, 6: 602
- Skin
effects of radiation on, 6: 506(R)
- Skin diseases
occurrence of, following administration of I^{131} in hyperthyroid therapy, 6: 1087(J)
radiotherapy of, with As^{76} , 6: 1614(J)
- Smokes
diffusion of, in the atmosphere, 6: 756
diffusion of, in lower layers of the atmosphere, 6: 576(R), 1516(R), 1517(R), 1518(R), 1519(R), 1520(R)
dispersal of, effects of velocity and temperature of discharge on, 6: 675
- Snow
radioactivity in, on Puy de Dome, France, 6: 1358(J)
- Sodium
analysis of, for Ca, Mg, and K, 6: 815
chromatographic separation of, from Li, 6: 848(J)
combustion of, in controlled atmosphere, 6: 1630
determination of, by pile activation, 6: 549(J)
heat of reaction of, with water at 25°, 6: 1132(J)
infrared spectra of, calculations, 6: 161(J)
metabolism of, in x irradiated dogs, 6: 510(R)
neutron total cross sections for, 6: 1017(J)
spectrographic determination of, in organic solids, 6: 158
vapor pressure of, 6: 1670
- Sodium (labeled)
preparation of, by exchange with labeled NaCl, 6: 1395(J)
- Sodium (liquid)
compressibility of, temperature variation of, 6: 580(J)
thermal conductivity of, 6: 232, 1444(J)
- Sodium acetate
isotopic exchange reactions of, 6: 1626
- Sodium borates
coloration of, 6: 142(J)
effects of Ra radiation on photoelectric current in, 6: 1168(J)
- Sodium borohydrides
exchange reactions of, with H gas, 6: 1176
- Sodium bromide-sodium sulfate systems
fused, phase studies of, 6: 1398(J)
- Sodium carbonate systems
phase studies of UO_3 , 6: 180
- Sodium chloride-sodium sulfate systems
fused, phase studies of, 6: 1398(J)
- Sodium chlorides
coloration and luminescence of, radiation-induced, 6: 142(J)
ionization of, 6: 541(J)
melting of, mechanism of structure breakdown in, 6: 118
photoelectric current in, moment of, 6: 1168(J)
self-absorption and self-scattering of β particles by, 6: 1344
vapor pressure determination of, 6: 1239(R)
- Sodium dithionite
radiosensitivity effects of, 6: 46, 48
- Sodium fluoferrates
infrared spectrum of, 6: 1667(J)
- Sodium formates
radiosensitivity effects of, 6: 46
- Sodium hydroxides
determination of, in presence of Na_2CO_3 , 6: 109
- Sodium iodide crystals
in gamma-ray spectrometers, 6: 647
polishing techniques for, 6: 1810(J)
preparation of, 6: 646
protective containers for, 6: 1811(J)
response of, to charged particles, 6: 966(J)
- Sodium iodides
scintillation and luminescence of pure and Tl-activated, 6: 302(J)
- Sodium isotopes
nuclear properties of, 6: 1928
- Sodium isotopes Na^{21}
beta spectra and half lives of, 6: 735
- Sodium isotopes Na^{23}
mass of, measurement, 6: 1284(J)
nuclear magnetic moments of, 6: 995(J)
proton reactions (p,n), excitation functions for, 6: 1021(J)
- Sodium isotopes Na^{24}
formation of, by proton bombardment of Cu, 6: 700
nuclear spin of, 6: 1909
- Sodium nitrites
radiosensitivity effects of, 6: 23
- Sodium oxides
solubility of, in K, 6: 1237
solubility of, in Na-K alloys, 6: 1237
- Sodium-potassium alloys
solubility of oxygen in, 6: 1237
- Sodium-potassium alloys (liquid)
thermal conductivity of, at 200 to 815°C, 6: 232
- Sodium sulfates
adsorption of dissolved "impurities" in, on liquid surfaces, 6: 176(J)
- Sodium uranyl carbonate systems
phase studies of, 6: 180
- Solid solutions
(See also subheading constitution diagrams under specific materials.)
phase studies of, 6: 1153
properties of, 6: 1153
statistical analysis of, 6: 1153
thermodynamic stability of, factors affecting, 6: 1467(R)
- Solids
erosion of, by impingement of particles on, 6: 185
quantum theory of many electron problem in, 6: 754(J)
surface-area measurement of porous, 6: 1426
temperature and stress distribution in, equations for, 6: 863
theory of, 6: 1750(R)
- Solutions
(See also subheading solubility under materials.)
energy absorption by externally irradiated, 6: 1343
fluorescence of, under γ and α radiation and dependence on concentration of solutes, 6: 1749(R)
- Solvent extraction processes
(See also solvent extraction as subheading under material being extracted.)
bibliographies, 6: 1693(J)
theory of, 6: 1686
- Solvents
(See also specific substances used as solvents.)
influence of mixed, on solubilities of salts, 6: 100(J)
thermodynamic properties of mixed aqueous-organic, 6: 1631
- Sound
effects on mixtures, review, 6: 286

- Spectrographic analysis
(See also as subheading under specific materials.)
for isotopic composition of elements, 6: 1573(P)
of refractory materials, carbon effect in, 6: 160(J)
- Spectrometers
(See also Beta spectrometers; Gamma spectrometers; Mass spectrometers; Neutron spectrometers; Spectrographic analysis.)
double channel coincidence type, design, 6: 1499
focusing in, with sector-shaped, uniform magnetic field, 6: 450(J)
in investigating nuclear energy levels, 6: 424(J)
scintillation, design and improvement of resolving power of, 6: 1511
trajectories in an axial focusing double lens, 6: 1795(J)
two-meter crystal, design, 6: 446(R)
- Spectrophotometers
design of, for cytochemical study, 6: 1374
- Spectroscopy
(See also the subheading spectra under specific materials; see also Mass spectrography; Spectrographic analysis; Spectrometers.)
conference on molecular, in Basel, 6: 448
of radioactive molecules, principal problems in, 6: 443
Spectroscopy Lab., Univ. of Chicago
progress reports, 6: 1302(R)
- Sperm
effects of radiation on respiration in, 6: 1084
- Spheres
preparation of precise, and technique for drilling small holes in, 6: 861
velocity and pressure distribution of liquids flowing in, 6: 1440(R), 1441(R)
- Spinel
(See also specific materials.)
thermal conductivity of, 6: 204
- Spleen
blood perfused, supernatant plasmas of, for radiation protection, 6: 763
metabolism of lactates in, 6: 171(J)
role of, in x-radiation injury, 6: 520(R)
shielding of, as protection against radiation injuries, 6: 763
shielding of, during x irradiation, 6: 516(R)
- Stable isotopes
(See also specific stable isotopes.)
production, separation, and applications of, 6: 287(J)
properties, lecture on, 6: 1261
separation of, by calutrons, 6: 1791
- Stack disposal
(See also Fission products; Meteorology; Radiation; Smokes.)
iodine removal using a Cottrell electrostatic precipitator, 6: 1092
meteorological factors in, at BNL, 6: 780
method for, at ANL, 6: 518(J)
- Stainless steel
cathodic sputtering of, 6: 252
corrosion of, by acids, 6: 1217
corrosion of, by Bi-Pb eutectic, 6: 901
corrosion of, by H₂O₂, 6: 240(J)
corrosion of, by H₃PO₄ aerated with He and by Ca and Na hypochlorite, 6: 1236
corrosion of, by liquid Bi, 6: 900
effects of liquid Bi-Pb alloy on, 6: 1723
electrochemical corrosion of, 6: 593
permeability of, to gases, 6: 1230(R)
permeability of, to He, 6: 272
thermal conductivity of, at 200 to 815°C, 6: 232
- Statistics
(See also Mathematics.)
in study of properties of solid solutions, 6: 1153
- Steam engineering
6: 489, 490
- Steel
(See also Carbon steel and Stainless steel.)
behavior of, in the V-notch Charpy test, 6: 902
combustion analysis of, for carbon, 6: 592
corrosion of, by acids, 6: 1217
dynamic coefficients, 6: 245(J)
metallography of, with polarized light, 6: 1228
notch sensitivity of, effect of quench-aging on, 6: 1730
photometric analysis of, for Al, 6: 1139(J)
transformation of retained austenite in, 6: 595
- Stilbene
preparation of crystals of, 6: 962(R)
response of crystals of, to charged particles, 6: 966(J)
scintillations in, 6: 961
- Stilbene (cont'd.)
4,4-Stilbenedicarboxamide
retention of, in liver cells, 6: 496(R)
- Stomach
effect of ACTH on secretions of, 6: 7
- Strain gages
design, calibration, and performance of wire resistance, 6: 936
- Streptomycin
in therapy of radioinduced bacteremia, 6: 1384
- Strontium
bone deposition of, 6: 1389
bone deposition of, effects of chemical agents on, 6: 69
chromatographic separation of, from Ba, Ca, and Mg, 6: 848(J)
ion exchange with U in uranyl nitrate, 6: 76
x-ray spectra, 6: 97(J)
- Strontium complexes
with fatty acids, formation constants of, 6: 77
- Strontium isotopes Sr⁸⁸
preparation of carrier-free, 6: 1422
- Strontium isotopes Sr⁹⁰
beta spectra of, 6: 735
- Styrene
kinetics of polymerization of, induced by γ radiation, 6: 1552(R)
- Styrenes
properties and synthesis of, 6: 1177(R)
- Sucrose
hydrolysis of, by invertase, 6: 1704(J)
production of, in photosynthesis, 6: 167
- Sugars
(See also Carbohydrates; Hexoses.)
separation of, by ion exchange, 6: 148, 843(J)
- Sugars (labeled)
synthesis of, 6: 1430
- Sulfides
exchange reactions of, with thiocyanate ions, 6: 87
- Sulfur
determination of, in Fe by H reduction, 6: 1658(R)
microdetection of, 6: 107
- Sulfur coatings
on a mirror surface, 6: 1304(R)
- Sulfur dioxide-heptane systems
diffusion in, 6: 537
- Sulfur fluorides
infrared spectrum of S₂F₁₀, 6: 1411(J)
- Sulfur isotopes S³¹
beta spectra and half lives of, 6: 735
- Sulfur isotopes S³²
abundance of, in nature, 6: 1793
binding energy of, calculation, 6: 333(J)
gamma reactions (γ ,np), 6: 1871(J)
mass of, 6: 991(J), 1553
- Sulfur isotopes S³³
mass of, 6: 991(J)
- Sulfur isotopes S³⁴
mass of, 6: 991(J)
- Sulfur isotopes S³⁵
beta spectra of, 6: 954(R)
beta spectra of, by nuclear-emulsion method, 6: 1560(J)
nuclear properties of, 6: 1928
radioautographic uses, 6: 795(J)
- Sulfur isotopes S³⁶
mass, nuclear spin, and relative abundance of, 6: 340(J)
- Sulfuric acid-phenol systems
diffusion in, 6: 804
- Superconductivity
(See also as subheading under materials.)
isotopic factors in, of Hg, 6: 993(J)
- Superconductors
audiofrequency experiments on, 6: 920(J)
- Surface tension
(See also as subheading under specific materials.)
methods of measurement of, by glasses, 6: 202
- Surfaces
area measurement of metals, 6: 897
area measurement of porous solids, 6: 1426
- Suspensions
dynamics of particulate matter in fluid, 6: 184
- Sweat cooling
(See also as subheading under materials and units cooled.)
protection achieved by, on porous metals, 6: 864

Synchrometers

(See Mass spectrometers.)

Synchrosopes

(See Oscillographs.)

Synchrotrons

(See also Brookhaven synchrotron.)

- design of, 6: 714(J)
- frequency modulated accelerating system for, 6: 380(J)
- non-ferromagnetic, design, 6: 1883
- target radiation in, angular distribution of, 6: 1885(J)
- theory of, 6: 918
- vacuum system for, 6: 586(J)
- x-ray spectrum of, measurement of, 6: 1028

Szilar-Chambers Reactions

- chemical separation by, 6: 1679(J)
- in neutron-irradiated quinoline oxalate, 6: 1167(J)

Tantalum

- activation determination of, in ores, 6: 1451
- corrosion of, by Bi-Pb eutectic, 6: 901
- corrosion of, by H₂O₂, 6: 240(J)
- corrosion of, by liquid Bi, 6: 900
- gamma absorption in, 6: 1533
- gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538
- oxidation of, cubic law of, 6: 1462
- physical properties of, bibliography on, 6: 905
- proton reactions (p,n), 6: 1859
- proton reactions (p,n), thick-target yield in, 6: 1535
- purification of, by volatilization or solution of chlorides, 6: 847(J)
- scattering of neutrons by, 6: 980
- separation of, from Nb, 6: 846(J)
- thermal capacity of, 6: 560

Tantalum borides

- crystal structure and properties of, 6: 120

Tantalum bromides

- trouton constants of, 6: 810(J)

Tantalum carbide-titanium carbide-tungsten carbide systems

- phase studies of, 6: 1126(J)

Tantalum chlorides

- trouton constants of, 6: 810(J)

Tantalum-chromium alloys

- crystal structure of, from x-ray-diffraction data, 6: 1249(J)

Tantalum electrodes

- formation and polarization of anodic oxide films on, 6: 1227

Tantalum fluorides

- vapor pressure of, 6: 810(J)

Tantalum iodides

- trouton constants of, 6: 810(J)

Tantalum-iron-nickel alloys

- composition and physical properties of, 6: 909(J)

Tantalum isotopes Ta¹⁸¹

- deuteron reactions (d,n), 6: 152
- gamma absorption cross sections of, 6: 1326
- gamma cross sections of, 6: 364, 1012(J), 1871(J)

Tantalum isotopes Ta¹⁸²

- decay schemes of, 6: 424(J), 444(R)

Tantalum-molybdenum alloys

- phase studies of, 6: 1256(J)

Tantalum ores

- activation analysis of, for Ta, 6: 1451

Tantalum oxides

- electrolysis of, in phosphate melts, 6: 811(J)

Tantalum phosphides

- preparation of, by electrolysis, 6: 811(J)

Tantalum-titanium alloys

- phase studies of, 6: 1732

Tantalum-zirconium alloys

- phase studies and tensile properties of, 6: 1475(R)

Technetium

- separation of, from fission products, 6: 1424(R)

Technetium isotopes

- decay schemes of, 6: 1907

Technetium isotopes Tc⁹⁹

- beta spectra of, 6: 1048
- internal conversion in, effect of chemical combination on, 6: 733
- isomeric transition in, effect of chemical combination on, 6: 734

Technetium sulfides

- preparation of, 6: 1397(J)

Teeth

- from Florida phosphate deposits, comparison with recent bones, 6: 764

Television tubes

(See Cathode-ray tubes.)

Tellurium

- electroplating of, 6: 1304(R)
- neutron resonance cross sections of, 6: 1304(R)
- neutron scattering cross sections of, 6: 1304(R)

Tellurium isotopes Te¹²¹

- half lives and γ energies in, 6: 739(J)
- isomeric magnetic dipole transitions in, 6: 335

Tellurium isotopes Te¹²³

- half lives and γ energies in, 6: 739(J)
- isomeric magnetic dipole transitions in, 6: 335
- isomers of, upper limit to half lives of, 6: 1555
- nuclear magnetic moments of, 6: 994(J)

Tellurium isotopes Te¹²⁴

- energy levels, of, properties of, 6: 1914(J)

Tellurium isotopes Te¹²⁵

- half lives and γ energies in, 6: 739(J)
- isomeric magnetic dipole transitions in, 6: 335
- isomers of, upper limit to half lives of, 6: 1555
- nuclear magnetic moments of, 6: 994(J)

Tellurium isotopes Te¹²⁷

- half lives and γ energies in, 6: 739(J)
- preparation of carrier-free, 6: 1422

Tellurium isotopes Te¹²⁹

- half lives and γ energies in, 6: 739(J)
- preparation of carrier-free, 6: 1422

Tellurium isotopes Te¹³¹

- isomers of, yields of, 6: 1424(R)

Temperature

(See also Thermometry.)

- effects on radiosensitivity, 6: 94(J)
- effect on x-ray-induced chromosomes, 6: 26

Temperature recording devices

- design and performance of, 6: 1780

Tennessee Univ.

- progress reports, 6: 186(R), 504(R), 1441(R)

Terbium isotopes

- alpha emission from, 6: 410, 1556

Terramycin

- radiosensitivity effects of, 6: 50

Testosterone

- biosynthesis of, from acetate, 6: 173(J)

Testosterone, 17 α -ethynyl-(labeled)

- synthesis of, 6: 170(J)

Thallium

- diffusion of, in Sn, 6: 895
- radiometric analysis of, 6: 535

Thallium complexes

- with 2-methyl-8-quinolinol, stability of, 6: 1141(J)

Thallium-indium alloys

- phase studies of, 6: 1238(R)

Thallium isotopes Tl²⁰¹

- formation of, 6: 496(R)

Thallium isotopes Tl²⁰²

- formation of, 6: 496(R)

Thallium isotopes Tl²⁰³

- isomers of, upper limit to half lives of, 6: 1555

Thallium isotopes Tl²⁰⁴

- half lives of, 6: 1628
- spectra of, 6: 1304(R)

Thallium isotopes Tl²⁰⁸

- internal conversion lines of, 6: 995(J)

Thallium nitrates

- self-absorption and self-scattering of β particles by, 6: 1344

Thenoyltrifluoroacetone complexes

(See Acetone, thenoyltrifluoro- complexes.)

Thermal analysis

(See Differential thermal analysis.)

Thermal conduction

(See also Heat transfer.)

- solution of a differential equation in two- and three-dimensional problems, 6: 1714

Thermal conductivity

(See also as subheading under specific materials.)

- measurement of, for refractory materials, 6: 204
- methods of measurement of, for liquid metals, 6: 1444(J)

Thermal neutrons

- absorption cross section of Li⁷ for extra-nuclear contribution to, 6: 1873(J)
- density of, diffusion of, diffusion lengths of, in heavy water, 6: 1831

- Thermal neutrons (cont'd.)
 detection and measurement of, in reactors, 6: 666(J)
 detection of, by liquid scintillators containing B, 6: 1286
 detection of, by proportional counters, 6: 1288
 diffraction of, by single crystals, 6: 721(J)
 scattering of, in liquids, 6: 726(J)
 theory of fluctuation scattering of, in solids, 6: 1830
- Thermal reactors
 (See also specific thermal reactors.)
 design of, lecture on, 6: 1323
- Thermocouples
 (See also Pyrometers; Thermometers.)
 calibration of Mo-W, Ta-W, and Nb-W, 6: 276
 calibration of W-Mo, 6: 1259(J)
 development of, for operation at 1600 to 2000°C, 6: 1498
 manuals on, 6: 627
 as neutron-density detectors, 6: 1583(P)
 nomographs, 6: 1713
 performance of bare-wire, in air streams, 6: 1713
 performance of Pt/Pt-Rh, 6: 1226
 thermoelectric potential of Hg-Fe, 6: 579
- Thermodynamics
 (See also thermodynamic properties under specific materials; see also Physics.)
 tables of heats, free energies, and entropies in liquid ammonia, 6: 809
- Thermometers
 (See also Bolometers; Pyrometers; Thermocouples.)
 calibration of, for low temperature measurements, 6: 1484
 for use in range 2 to 20°K, 6: 1280(J)
- Thermometry
 6: 960(R)
 bibliographies and manuals on, 6: 627
- Thickness gages
 design and performance of, 6: 937
 design of, based on γ -ray transmission, 6: 191
- Thiocyanate complexes
 spectrophotometric analysis of, 6: 539
- Thiocyanates
 exchange reactions of, with sulfide and cyanide ions, 6: 87
- Thiophosphoryl fluoride
 microwave spectra and structure of, 6: 1165
- Thiourea complexes
 (See Urea, thio- complexes.)
- Thorium
 colorimetric determination of, in low-grade minerals, 6: 1401
 decay schemes of, 6: 444(R)
 determination and separation of, from U, 6: 1148(J)
 gamma spectra of, 6: 446(R)
 ion exchange with U in uranyl nitrate, 6: 76
 neutron emission, in spontaneous fission of, 6: 1851(J)
 separation from rare earths with anisic acid, 6: 1147(J)
 separation from rare earths with camphoric acid, 6: 1150(J)
 slow neutron transmission of, 6: 984
 toxicology of, 6: 526(R)
- Thorium-aluminum alloys
 metallography of, with polarized light, 6: 1228
- Thorium chloride complexes
 in aqueous solution, ionization of, 6: 1625
- Thorium complexes
 with chloride, fluoride, nitrate, phosphate, and sulfate, 6: 1130(J)
 with chloride and thenoyltrifluoroacetone in water, ionization of, 6: 1625
- Thorium compounds
 toxicology of inhaled, 6: 528
- Thorium fluorides
 magnetic properties of solutions of, with UF₄, 6: 857(J)
- Thorium hydrides
 explosive limits of, 6: 1627
- Thorium isotopes
 decay schemes of, 6: 1907
- Thorium isotopes Th²³⁴
 separation of, from Pa²³⁴ by ion exchange, 6: 437(J)
- Thorium-magnesium-zirconium alloys
 metallurgical properties of, 6: 903(R)
- Thorium nitrate-water systems
 phase studies at 20 to 160°C, 6: 82
- Thorium nitrates
 solubility in hexanol and octanone, effects of impurities on, 6: 83
- Thorium ores
 (See also Monazite.)
 bibliographies on, 6: 212
 radioautographic analysis of, 6: 1809(J)
- Thorium oxide-cerium oxide systems
 reduction of, by H₂, 6: 1683(J)
- Thorium oxides
 thermal conductivity of, up to 1300°C, 6: 1488(R)
- Thorium powders
 explosive limits of, 6: 1627
- Thorium-selenium alloys
 metallography of, with polarized light, 6: 1228
- Thulium isotopes Tm¹⁷⁰
 spectrum of, Fermi analysis, 6: 1356(J)
- Thyroid diseases
 therapy of, with I¹³¹, 6: 67(J), 68(J)
- Thyroid gland
 effect of radiation on activity of, 6: 31
 effects of adrenaline on, 6: 1075
 histological and pathological effects of I¹³¹ on, 6: 1604(J)
 radioautographic analysis of, using At and I, 6: 49(R)
- Thyronine
 effects on ascorbic acid oxidation, 6: 80
- Thyronine, 3,5-diiodo-
 effects on ascorbic acid oxidation, 6: 80
- Thyroxine
 effects on ascorbic acid oxidation, 6: 80, 803
- Thyroxine, sodium derivatives
 effects on ascorbic acid oxidation, 6: 80
- Time measurement
 (See also specific instrument used, i.e., Oscillographs; Pulse generators, etc.)
 equipment for, 6: 479(P)
- Tin
 absorption of photons of cosmic radiation in, 6: 258(J)
 colorimetric determination of, 6: 1137
 corrosion of, by H₂O₂, 6: 240(J)
 deuteron range-energy relation in, 6: 1032(J)
 dynamic coefficients of, 6: 245(J)
 electric properties of, in superconducting state, 6: 920(J)
 electrolytic separation and determination of, 6: 1138(J)
 gamma absorption in, 6: 1533
 x-ray spectra, 6: 97(J)
- Tin-copper alloys
 phase studies of, 6: 600(R), 1238(R)
- Tin isotopes
 superconductivity of, measurement, 6: 1748
- Tin isotopes Sn¹¹³
 decay schemes of, 6: 739(J)
- Tin isotopes Sn¹¹⁷
 energy levels and half lives of, 6: 739(J)
 isomeric magnetic dipole transitions, 6: 335
- Tin isotopes Sn¹¹⁸
 neutron activation cross section of, 6: 1052(J)
- Tin isotopes Sn¹¹⁹
 gamma emission and conversion electrons from, 6: 1052(J)
 isomeric magnetic dipole transitions in, 6: 335
- Tin isotopes Sn¹²³
 decay schemes of, 6: 739(J)
 yield and half lives of, from U²³³ and U²³⁵ fission, 6: 1857
- Tin isotopes Sn¹²⁴
 binding energy of, calculation, 6: 333(J)
- Tin-lead alloys
 dynamic coefficients of, 6: 245(J)
- Tin oxide compacts
 thermal and mechanical properties of, with 1% ZnO, 6: 884
- Tin oxides
 colorimetric analysis of, 6: 1137
- Tin-zirconium alloys
 constitution diagrams of, 6: 591(R)
- Tissue culture
 photography as an aid in observation of changes in, 6: 797(J)
- Tissue homogenates
 radiosensitivity effects of, 6: 520(R)
- Tissues
 (See also the specific tissues.)
 dosage determination of fast neutrons and gamma radiation in standard, 6: 1508
 effects of radiation on, 6: 34
 ionization of, at various depths, 6: 404(J)
 radiometric analysis of, 6: 512(J)
 radiometric analysis of, by dissolving in scintillating liquids, 6: 294
 radiometric analysis of, sample preparation for, 6: 965(J), 968(J)
 respiration of, 6: 792

SUBJECT INDEX

- Titanates**
organic, association of, in benzene solution, 6: 1120(J)
- Titanium**
cathodic sputtering of, 6: 252
coatings for, 6: 604(R)
combustion analysis of, for carbon, 6: 592
corrosion of, by HCl and H₂SO₄, 6: 588
corrosion of, by H₃PO₄ aerated with He and by Ca and Na hypochlorite, 6: 1236
crystal structure of, effect of heat-treatment and additions of O₂, C, and N₂ on, 6: 238(J)
crystal structure of, effect of O on mechanical properties and working of, 6: 1247(J)
electrochemical corrosion of, 6: 597(R)
electrolysis of, 6: 597(R)
electrolytic preparation of, 6: 1691(J)
electroplating of, 6: 604(R)
fabrication and machining of, 6: 906(J)
grain refinement by addition of, to Al alloy castings, 6: 1253(J)
grinding of, 6: 910(J)
infrared spectra of, calculations, 6: 161(J)
metallography of, with polarized light, 6: 1228
metallurgy symposium, properties and possible uses of, 6: 237
oxidation of, cubic law of, 6: 1462
oxidation of, logarithmic growth law for, 6: 161(J)
production of, review of methods for, 6: 913(J)
spectrophotometric analysis of, with thymol, 6: 1149(J)
spectrophotometric determination of traces, in Zr using tiron, 6: 1656
- Titanium alloys**
grinding of, 6: 910(J)
metallurgy symposium, properties and possible uses of, 6: 237
- Titanium-aluminum alloys**
constitution diagram and microstructure of, 6: 908(J)
crystal structure of, from x-ray diffraction data, 6: 1243(J)
preparation of, from TiO₂ and Al powder, 6: 607(J)
- Titanium borides**
crystal structure and properties of, 6: 120
- Titanium carbide-tantalum carbide-tungsten carbide systems**
phase studies of, 6: 1126(J)
- Titanium carbides**
high-temperature reactions with metals, 6: 1216(J)
reactions of, with boron carbide above 1920°, 6: 208(J)
- Titanium compounds**
molecular electric moments of, 6: 1128(J)
- Titanium couples**
corrosion of, by synthetic ocean water aerated with He, 6: 1236
- Titanium hydrides**
explosive limits of, 6: 1627
- Titanium-iron alloys**
surface tension of, 6: 1449(R)
- Titanium isotopes Ti⁴⁷**
nuclear magnetic moment of, 6: 1850(J)
- Titanium isotopes Ti⁴⁸**
nuclear magnetic moment of, 6: 1850(J)
- Titanium-lead couples**
corrosion of, by synthetic ocean water, 6: 1236
- Titanium-manganese alloys**
phase studies of, 6: 1732
- Titanium oxides**
dielectric properties of, measured by electromagnetic resonators, 6: 1493
electric and thermoelectric properties of partially reduced, 6: 206(J)
production of, by chloride decomposition, 6: 1944(P)
- Titanium(III) oxides**
adsorption of A on, 6: 154(J)
- Titanium(IV) oxides**
ceramic containing, properties of, 6: 886(P)
electric conductivity of, in polycrystalline annealed, 6: 1214
high-voltage polarization of, in polycrystalline annealed, 6: 1215(J)
ionization of, 6: 541(J)
reduction of, by Al powder, 6: 607(J)
- Titanium powders**
explosive limits of, 6: 1627
- Titanium-tantalum alloys**
phase studies of, 6: 1732
- Titanium-tungsten alloys**
phase studies of, 6: 1732
- Titanium-zirconium alloys**
constitution diagrams of, 6: 1229
corrosion of, by Al chlorides, Na and Ni, 6: 1236
phase studies of, 6: 233
properties of, 6: 1229
- Toluene**
ionization potential of, by mass spectrography, 6: 291(J)
- Tomography**
(See also Radiography.)
thickness of layers taken in, calculation of, 6: 1099(J)
- Topology**
convex bodies, symmetrization of, 6: 949
convex regions associated in subspaces, 6: 948
convex sets and additive set functions, 6: 950
- Torbernite**
occurrence of, in Clear Creek County, Colorado, 6: 214
- Torbenite deposits**
exploration of, for U in Grant Co., New Mexico, 6: 1457
in Missouri fire clay, 6: 1728(J)
- Torpedo Experimental Establishment, Greenock (Great Britain)**
progress reports, 6: 859(R)
- Towne Scientific School, Univ. of Penn.**
progress reports, 6: 229(R), 1658(R)
- Tracer techniques (biology)**
bibliography, 6: 73(J)
- Tracer techniques (botany)**
review of, 6: 1621(J)
- Tracer techniques (metallurgy)**
for assessing wear of wire-drawing dies, 6: 195(J)
- Tracer techniques (mineralogy)**
use of, in flotation and beneficiation studies, 6: 251(R)
- Trauma**
surgical, effects on polysaccharide and sulfhydryl levels in blood plasma 6: 1594
surgical, effects on sulphydryl content of blood plasma, 6: 1593
- Treasure Hill Area (Colorado)**
geology and prospecting of, for U, 6: 1456
- Treasure Hill Claims (Colorado)**
prospecting of, for U, 6: 1456
- Trisilylamine**
molecular structure of, 6: 136
- Tritium**
(See also Hydrogen.)
deuteron, proton, and triton absorption and scattering by, 6: 1859
mammalian uptake of, by lung, from labeled water vapor, 6: 1088(J)
neutrino mass from β spectrum of, 6: 1837(J)
neutron production by (d,n) reaction in, 6: 1525
nuclear properties of, 6: 1928
photodisintegration cross sections of, calculations, 6: 1868(J)
radioautographic uses of, 6: 61(J)
tolerance levels of, 6: 1088(J)
toxicology of, 6: 526(R)
- Tritons**
acceleration of, by Cockcroft-Walton accelerator, 6: 1886(J)
measurement of tracks of, in nuclear emulsions, 6: 644
range-energy relation of, from Be⁹(d,t), 6: 375(J)
reactions of, with deuterons, 6: 1528
- Tubes**
(Generally thin-walled, small diameter; see also subheading under specific reactors; see also Electron tubes; Geiger-Mueller tubes; Pipes; Reactor tubes.)
heat transfer in, by forced convection, 6: 867
- Tumors**
(See also specific tumors, organs, tissues, animals, etc.; see also the subheading biological effects under radiations; see also Carcinomas; Sarcomas.)
of bone, diagnosis and treatment with radioactive Ga, 6: 1106(J)
effects of cysteine on radiosensitivity of, 6: 1608
effects of radiation on cells of, 6: 65(J)
enzymes of the citric cycle in, 6: 761
of head and neck, treated with Co⁶⁰, 6: 1103(J)
induced by β particles in rats, 6: 506(R)
induced by I¹³¹, 6: 776(J)
lymphoid, inhibition of, by shielding during partial-body irradiation, 6: 1382(J)
metabolism of lactates in, 6: 171(J)
origin of, mutation theory of, 6: 18(J)
pituitary, induced in mice by I¹³¹, morphology of, 6: 1076, 1080
pyruvate oxidation in mitochondria of, 6: 760
radiosensitivity effects of, 6: 520(R)
skin, radiotherapy of, with As⁷⁶, 6: 1614(J)
toxicity of, therapy with vitamin B₁₂, 6: 55(J)
transplantation of I¹³¹ produced pituitary, to normal and I¹³¹ treated hosts, 6: 1080
- Tungsten**
corrosion of, by liquid Bi, 6: 900
electric conductivity of, effect of elastic deformation on, 6: 241(J)

- Tungsten (cont'd.)
 gamma reactions (γ, n) at 320 and 160 Mev, 6: 1538
 proton reactions (p, n), 6: 370(J), 1859, 1887
 proton reactions (p, n) thick-target yield in, 6: 1535
- Tungsten carbide-tantalum carbide-titanium carbide systems
 phase studies of, 6: 1126(J)
- Tungsten carbides
 metallography of, with polarized light, 6: 1228
- Tungsten isotopes W^{181}
 separation of, from deuterium bombarded Ta, 6: 152
- Tungsten isotopes W^{183}
 isomeric transition of, 6: 409
- Tungsten isotopes W^{187}
 decay schemes of, 6: 444(R)
 gamma spectra of, 6: 446(R)
- Tungsten minerals
 diagnostic associates in Morocco, 6: 1460(J)
- Tungsten-titanium alloys
 phase studies of, 6: 1732
- Tungsten-zirconium alloys
 constitution diagrams, 6: 591(R)
- Turbojet engines
 control systems for, mathematical analysis of, 6: 860
 design of, for nuclear aircraft, 6: 1589
- Ultrasonic radiation
 isotope separation by, 6: 286
- Ultraviolet radiation
 effects on grasshopper neuroblasts, 6: 43(J)
 lethal effects on yeast, 6: 10
- Uranium
 absorption of γ radiation by, 6: 680(R)
 abundance of, in meteorites, 6: 1754
 concentration of, in sea water by fluorimetry, 6: 1403(J)
 coulometric analysis of, for V, 6: 574(J)
 coulometric determination of, 6: 90(R)
 crystal structure of, 6: 121(J)
 crystal structure of β phase, 6: 1183
 deformation textures of, 6: 1478(J)
 determination of, in U-Hg alloys, 6: 545
 fission, theory of, 6: 1840
 fission products of, Be^7 in, 6: 358
 fluorimetric determination of, in lignites, monazites, and shales, 6: 1136
 fluorimetric determination of, in minerals, 6: 1404(J)
 gamma absorption in, 6: 1543
 ion exchange with fission products and Th, 6: 76
 magnetic susceptibility of, 6: 1433, 1943(J)
 meson induced fission of, 6: 1860
 metallography of, with polarized light, 6: 1228
 neutron capture cross section of, 6: 1540(J)
 occurrence in Utah (Piute Co.), 6: 1221, 1222, 1223, 1224
 oxidation of, in O_2 , 6: 1435(J)
 photofission of, isotope yields in, 6: 1424(R)
 plastic deformation of, mechanism of, 6: 226
 potentiometric determination of, in presence of Fe, 6: 1649
 preferred orientation in rolled, 6: 1477(J)
 production of, from UO_2 , review of methods for, 6: 218(J)
 reaction between U(VI) and U(IV) in carbonate media, polarographic study of, 6: 855
 reaction of, with H_2 , HD, and D_2 , 6: 573
 reduction of, by Cd amalgam and coulometric titration of, 6: 1400
 separation of Th from, 6: 1148(J)
 toxicology of, 6: 526(R)
 yields of Ba^{140} , Mo^{99} , and Ag^{111} from proton fission of, 6: 1856
- Uranium alloys
 magnetic susceptibility of, 6: 1433
- Uranium-aluminum alloys
 metallography of, with polarized light, 6: 1226
- Uranium carbides
 preparation of, methods for, 6: 1564(P)
- Uranium(IV) chlorides
 adsorption spectra of, 6: 1628
 production of, from uranium oxide, 6: 463(P)
- Uranium(V) chlorides
 preparation of, process and apparatus for, 6: 1569(P)
- Uranium(VI) chlorides
 preparation of, process and apparatus for, 6: 1569(P)
 production of, from uranium pentachloride, 6: 460(P)
 purification and packaging of, 6: 466(P)
- Uranium-chromium alloys
 crystal structure of, 6: 121(J)
 crystal structure of β phase, 6: 1183
 magnetic susceptibility of, 6: 1433
- Uranium-cobalt alloys
 of composition UCo_2 , 6: 471(P)
 magnetic susceptibility of, 6: 1433
- Uranium-cobalt compounds (intermetallic)
 of composition U_5Co , 6: 472(P)
- Uranium deposits
 diagnostic associates, 6: 1458
 origin of, in Shinarump Formation, Colorado Plateau, 6: 891(R)
- Uranium fluorides
 magnetic properties of solutions of, with ThF_4 , 6: 857(J)
- Uranium(VI) fluorides
 mass spectrographic separation of U isotopes in, methods of calculation of, 6: 288
- Uranium hydrides
 explosive limits of, 6: 1627
- Uranium isotopes
 mass spectrographic separation of, in UF_6 , 6: 288
 rapid separation methods for, from cyclotron bombarded $Th(NO_3)_4$, 6: 1685
- Uranium isotopes U^{233}
 fission product yields, 6: 1857
- Uranium isotopes U^{235}
 fission of, 6: 493(J), 698
 fission of, ternary, 6: 707(J)
 fission products of, 6: 1327(J)
 fission product yields, 6: 1857
 nuclear properties of, 6: 1928
- Uranium isotopes U^{238}
 binding energy of, calculation, 6: 333(J)
 decay of, fine structure in, 6: 1921(J)
- Uranium isotopes U^{239}
 internal conversion of, 6: 409
- Uranium-magnesium alloys
 metallography of, with polarized light, 6: 1228
- Uranium-manganese alloys
 magnetic susceptibility of, 6: 1433
- Uranium-mercury alloys
 chemical analysis of, 6: 545
- Uranium minerals
 (See also specific minerals and ores; see also Uranium ores.)
 occurrence of, in Clear Creek County, Colorado, 6: 214
- Uranium-molybdenum alloys
 chemical analysis of, 6: 544
- Uranium-nickel alloys
 magnetic susceptibility of, 6: 1433
- Uranium ores
 (Including tailings, residues, etc., worked for recovery of uranium; see also specific ores, e.g., Carnotite ores; Chattanooga shales; Pitchblende; etc.; see also Uranium minerals.)
 beneficiation of, 6: 251(R)
 bibliographies, 6: 212
 extraction of U from, in Norway, 6: 217(J)
 occurrence of, in Argentina, 6: 215(J)
 radioautographic analysis of, 6: 1809(J)
 radiometric analysis of, for U_3O_8 , 6: 1220
- Uranium(VI) oxide systems
 phase studies of, 6: 180
- Uranium oxides
 composition of, 6: 856(J)
 electrodeposition of, process for, 6: 1568(P)
 lung deposition and retention of, following inhalation, 6: 1089(J)
 refining of, review of methods, for, 6: 218(J)
- Uranium(IV-VI) oxides
 production of, from ores in Norway, 6: 217(J)
 radiometric determination of, in, uranium ores, 6: 1220
- Uranium powders
 explosive limits of, 6: 1627
- Uranothorite
 occurrence and identification of, in Blue Jay Mines, 6: 1453
- Uranyl carbonate systems
 phase studies of, 6: 180
- Uranyl chlorides
 raman spectra of, 6: 156
- Uranyl nitrate systems
 ions exchange in, involving Th and fission products, 6: 76
- Uranyl nitrates
 fission activity distribution in bombarded, 6: 731
 Raman spectra of, 6: 156

- Uranyl sulfate complexes
 potentiometric and extinction studies of, 6: 1434(J)
- Urea, thio- complexes
 with Ru, formation and properties of, 6: 1119
- Urine
 analysis of, 6: 1(R)
 analysis of, for gross radioactivity, 6: 103
 analysis of, for polyglucose, 6: 1652
 effect of saline and pituitary hormone on excretion of, by the rat, 6: 1622(J), 1623(J)
 radiometric analysis of, for K, 6: 1116
- Utah (Piute Co.)
 U exploration of Benny K claims, 6: 1221
 U exploration of Dark Horse and Saturday Claims areas, 6: 1224
 U exploration of East Slope Area, 6: 1222
 U exploration of Papsy's Hope prospect, 6: 1223
- V particles
 detection of decay products of neutral, 6: 1872(J)
 formation and decay schemes of neutral, 6: 1488
 formation of neutral, by bremsstrahlung on C and Pb, 6: 1872(J)
 mass and decay schemes of, 6: 264(J)
- Vacuum gages
 design of, 6: 1750(R)
 design of, based on optical absorption in Schumann region, 6: 879(J)
 design of ionization-type, 6: 1804(J)
 design of, using α -particles, 6: 587(J)
 review of, for pressures below 10 mm Hg, 6: 582(J)
 for synchrotron vacuum system, performance of, 6: 1209(J)
- Vacuum pumps
 control of, 6: 196
 design modification of, to simplify oil changing, 6: 877(J)
 efficiency of, effect of oil distillation on, 6: 880(J)
 portable laboratory stand for, 6: 1208(J)
 types of, review and comparison of, 6: 194(J)
- Vacuum seals
 design of, for fluorine generations system, 6: 470(P)
- Vacuum systems
 application of mass spectrometers to problems of, 6: 585(J)
 design of apparatus for introduction of gas to give known pressure in, 6: 881(J)
 design of industrial, 6: 198(J)
 leak detection in, 6: 583(J)
 manifold for, 6: 1210(J)
 measurement of pressure and contamination in, 6: 1804(J)
 for a proton synchrotron, 6: 586(J)
 techniques concerning, book on, 6: 197
 valve for, pneumatically controlled, 6: 1725(J)
- Vacuum techniques
 manuals on, for beginners, 6: 878
- Vagomimetic substances
 effects on survival of x-irradiated mice, 6: 1093
- Valeric acid, α -bromo-
 polarographic behavior of, 6: 538
- Valves
 design of high pressure, 6: 575
- Van de Graaff accelerators
 (For Van de Graaff machines used for instruments other than accelerators see also Van de Graaff generators.)
 design of, at University of Zürich, 6: 1884(J)
 gaseous insulator for, SF₆, 6: 1393(R)
 neutron background of, 6: 1535
 operation of, 6: 1821(R)
- Vanadium
 by-product recovery of, from phosphate rock, 6: 1727
 by-product recovery of, from titaniferous magnetite, 6: 911(J)
 colorimetric determination of, 6: 90(R)
 combustion analysis of, for C, 6: 592
 coulometric determination of, in U, 6: 574(J)
 electroplating of, 6: 599(R)
 oxidation-reduction states of, 6: 542(J)
 superconductivity of, 6: 1739(J)
- Vanadium alloys
 sigma phase in, 6: 1246(J)
- Vanadium borides
 crystal structure and properties of, 6: 120
- Vanadium complexes
 with H₂O, CH₃OH, C₂H₅OH, and iso-C₄H₉OH, absorption spectra of, 6: 1644(J), 1645(J), 1647(J)
 with 2-methyl-8-quinollinol, stability of, 6: 1141(J)
- Vanadium(IV) ions
 chemical properties of, 6: 542(J)
- Vanadium(V) ions
 chemical properties of, 6: 542(J)
- Vanadium-nickel alloys
 structure of sigma phase of, 6: 1476(J)
- Vanadium oxides
 electrolysis of, in phosphate melts, 6: 811(J)
 preparation of, by electrolysis, 6: 811(J)
 sols of, coagulation with Au, Fe(OH)₃ and AgI sols, 6: 95(J)
- Vanadium phosphides
 preparation of, by electrolysis, 6: 811(J)
- Vapor pressure
 (See also as subheading under materials.)
 apparatus for determining, of Na, 6: 1670
 methods of measurement, 6: 275
 temperature variation of, nomographs, 6: 254
- Virial coefficients
 second, of a 6-9 gas at high temperatures tabulated results, 6: 1491
- Virus
 effects on uptake of C¹⁴ from glucose by amino acids in mouse brain, 6: 72(J)
- Vitamin B₁₂
 effects of ionizing radiation on, 6: 511(J)
 therapeutic effects of, in radiation sickness and tumor toxicity, 6: 55(J)
- Vitamins
 (For instances of known chemical nature see also as organic compounds.)
 effects on glycogen and nitrogen metabolism of liver after irradiation, 6: 1393(J)
- Vitro Corp. of America
 progress reports, 6: 830(K), 1184(R)
- Voltage regulators
 (See also Power supplies.)
 design of, 6: 1575(P)
 design of, for electroplating control, 6: 1777
- Voltmeters
 design of, for continuous current, 6: 1786(J)
- Waste disposal
 (For treatment of radioactive process wastes prior to disposal see Waste processing; see also the subheading waste disposal under specific chemical processes; see also Bacterial slimes; Sewage systems; Stack disposal.)
 effects of atomic energy industries on, 6: 1195(J)
 environmental problems of radioactive, lecture on, 6: 1212
 of I¹³¹ by dilution, 6: 883
 lecture on, 6: 781
 liquid storage, 6: 882(R)
 problems in treatment of radioactive, lecture on, 6: 1213
 solid storage as a means of, at Knolls Atomic Power Lab., 6: 1436
 system for, at ANL, 6: 518(J)
- Waste processing
 (Treatment of radioactive wastes to achieve reduction in volume and decontamination prior to disposal; for recovery of an element from filter cakes, raffinates, salvage wastes, etc., see the subheading recovery under the element; see also Waste disposal.)
 by evaporation, 6: 1211
 by evaporation, filtration, and incineration, and scrubbing, as practiced at Knolls Atomic Power Lab., 6: 1436
 by evaporation and incineration, 6: 882(R)
 by filtration, 6: 1747
 flow sheets for, at ANL, 6: 518(J)
 ion exchange, 6: 1628
 ion exchange unit for, in laboratories, 6: 830(R)
 problems in treatment of radioactive, lecture on, 6: 1213
 for removal of Pu, 6: 858(J)
 for removal of radioisotopes from water, 6: 54(J)
- Water
 (See also Radioactive waters; Rainwater.)
 absorption of x radiation by, 6: 392(J)
 decomposition of, by γ and x radiation, 6: 1678
 decomposition of, by x radiation, 6: 1605(J)
 decontamination of radioactive, method for, 6: 1(R), 1610
 decontamination of, using Fe form of National Aluminate cationic resin (HCR-Fe), 6: 1184(R)
 effects of radiation on, 6: 556, 1628
 monitoring, 6: 1(R), 277(R)
 photolysis of, by illuminated chloroplasts, 6: 567
 removal of P³² and I¹³¹ from, 6: 515

- Water (cont'd)
 radioisotope removal from, 6: 54(J)
 reactions in, produced by α -particles, 6: 143(J)
 reactions in, produced by ionizing radiation, 6: 144(J)
 thermo-osmosis of vapor through rubber, 6: 1776(J)
- Water-d₂
 electrolysis of, automatic apparatus for, 6: 828(J)
 mass spectrographic analysis of, 6: 547
- Water supplies
 (including plants, sources, distribution, storage, etc.)
 analysis of, for Ra, 6: 510(R)
 effects of atomic energy industries on, 6: 1195(J)
- Welding
 (Including gas, diffusion, arc, and resistance welding; see also specific materials and fabricated units, and subheading welding where provided.)
 laboratory unit for resistance, 6: 181
- Well logging
 calibration of diamond-drill-hole logging devices, 6: 1459
- West Point Claim (Colorado)
 prospection of, for U, 6: 1456
- West Stands Reactor
 construction and operation details of, 6: 353
- White Oak Creek system
 ecology of, 6: 1(R)
 fish in, size of, 6: 11
- White Signal District (New Mexico)
 exploration of, for U, 6: 1457
- Wind
 velocity measurement of, 6: 1516(R), 1517(R), 1518(R), 1519(R)
 velocity of, raw data, 6: 1520(R)
- Wind tunnels
 design of, for calibrating micrometeorological instruments, 6: 1519(R)
 design of, for meteorological studies, 6: 677(R)
- Wood
 corrosion of, by H₂O₂, 6: 240(J)
- Wyoming (Sweetwater Co.)
 airborne radioactivity survey of, 6: 589
- X radiation
 (See also Gamma radiation; Photons.)
 absorption of, by atoms in molecules, 6: 138(J)
 from Am²⁴¹ and Np²³⁷, 6: 413
 bibliography on effects of, on bacteria, 6: 1377
 biological effects of, as compared to radon, 6: 763
 biological effects, review of, 6: 783(J)
 chemical effects on nitrogen mustards, 6: 1680(J)
 chemical effects on solutions, 6: 1605(J)
 chemical effects on water, 6: 144(J), 1678
 detection and measurement of, 6: 59(R), 650(R)
 detection of, by various phosphors, 6: 403(R)
 dosage determinations of, 6: 668(J)
 dosage determinations of, using dental film, 6: 1613(J)
 dosages received by patients during diagnostic examination, measurement of, 6: 1100(J)
 effects on antibody formation, 6: 1375
 effects on bacteria, 6: 29, 47
 effects on barley seed, 6: 41(J)
 effects on cells, chemical modification of, 6: 49
 effects on chromosomes, 6: 24, 26
 effects on egg yolks, 6: 508
 effects on electrolyte retention in muscle, 6: 1077
 effects on enzymes, 6: 40(J)
 effects on erythrocytes, 6: 778(J)
 effects on fibrinogen, 6: 30
 effects on gastro-intestinal transit and absorption availability, 6: 37
 effects on halohydrocarbon solutions, 6: 1169(J)
 effects on hematopoietic cells, 6: 36
 effects on hematopoietic system, life span and reproductive system of reptiles, 6: 1090(J)
 effects on metabolism in liver, 6: 56(J)
 effects on nuclear emulsions, 6: 311(J)
 effects on paramecium, 6: 46; 48, 140
 effects on photographic film, 6: 730(J), 1681(J)
 effects on polysaccharide and sulphhydryl levels in blood plasma, 6: 1594
 effects on rats, 6: 50
 effects on respiration in E. coli., 6: 1079
 effects on seed, 6: 32
 effects on thyroid glands, 6: 31
 effects on wheat roots, 6: 44(J)
 genetic effects, metabolic and physiological effects of, 6: 506(R)
- X radiation (cont'd.)
 genetic effects of, on Drosophila, 6: 773(J)
 induction of dominant lethals by, in mice, 6: 45
 induction of lethal recessive factors by, 6: 769(J)
 lethal dosage determinations of, compared with α particles, 6: 1607(J)
 lethal dosage determinations of, for mice, 6: 506(R)
 lethal effects of, as modified by shielding of intestine of rabbits, 6: 1083
 mitotic effects on roots, 6: 39(J)
 monitoring and yield integrating of, from betatron, 6: 1798
 mutations induced by, in Drosophila, 6: 770(J)
 oxidation and reduction produced by, 6: 146(J)
 oxidation of arsenite in aqueous solution by, 6: 837(J)
 permissible limits of, in therapy, 6: 42(J)
 physiological effects of, on dogs, 6: 516(R)
 physiological effects of, studied in respiration and development of irradiated eggs and sperm of sea urchin, 6: 1084
 proportional counter for soft, 6: 309(J)
 protection against, by ethanol, ethyl carbamate, cysteine, and nembutal, 6: 1386(J)
 protection against, by methylamine, 6: 1385(J)
 relation between electron current and intensity of, in high energy electron accelerators, 6: 1027
 scattering of, by N, 6: 400(J)
 scattering of, in liquids, 6: 726(J)
 survey of personnel exposures to, in hospitals and clinics, 6: 779
 synergistic effects of simultaneous systemic and local, on lymphosarcoma, 6: 1082
 wavelength of, at a depth in water, 6: 392(J)
- X-ray-diffraction analysis
 (See also as a subheading under specific materials.)
 films for, 6: 971(J)
 at low temperatures, equipment for, 6: 617
 scattering factors for B, Be, C, F, H, He, Li, N and Ne, calculation of, 6: 1347(J)
 use in thickness measurements of metal coated cylinders, 6: 1486
- X-ray equipment
 (See also Radiography; X radiation; X-ray-diffraction analysis.)
 alignment of, 6: 62
 attachments for use in tomographic photography, 6: 785(J)
 design and operation of, 6: 403(R)
 design and performance of, 6: 59(R)
 design of, 6: 1(R)
- X-ray microscopy
 application to the study of deformed metals, 6: 1250(J)
- X-ray shielding
 design of, 6: 1582(P)
- X-ray spectra
 line widths in, 6: 1262(J)
 methods of measurement of, synchrotrons, 6: 1028
- Xanthates
 adsorption of, on mineral surfaces, 6: 1628
- Xenon
 collision probability for slow electrons in, 6: 1490
 fluorescence of, 6: 409
 neutron scattering cross sections of, 6: 679
- Xenon isotopes
 radioactivity of, from fission, 6: 1839
- Xenon isotopes Xe¹³¹
 energy levels of, from ¹³¹ β decay, 6: 436(J)
 half lives of excited states of, 6: 426(J)
 internal conversion of, 6: 422(J)
 isomeric magnetic dipole transitions in, 6: 335
 half lives of, 6: 1839
- Xylene
 absorption and fluorescence spectra of, 6: 1929
 fluorescence of, α - or γ -induced, 6: 653(R)
- D-Xylose (labeled)
 synthesis of, from glucose, 6: 172(J)
- Yeasts
 biosynthesis of arginine by, 6: 794
 genetic factors producing a triploid strain of, 6: 1591
 lethal effects of ultraviolet radiation and photo-reactivation on, 6: 10
 metabolism of, effects of x radiation on, 6: 506(R), 510(R)
 metabolism of, studied by synthesis of adenine thiomethylriboside, 6: 1072
- Ytterbium chlorides
 activity coefficients of, in aqueous solutions, 6: 558
 transference numbers of, 6: 563
- Ytterbium isotopes
 isomeric transition of, 6: 409

SUBJECT INDEX

- Ytterbium isotopes Yb¹⁷⁰
 internal-conversion coefficients of, 6: 1555
- Yttrium
 deposition of, in bone, 6: 70
 preparation of, by calcium reduction of chlorides, 6: 1171
 x-ray spectra, 6: 97(J)
- Yttrium isotopes Y⁹⁰
 beta spectra of, 6: 735
- Yttrium oxide-zirconium oxide systems
 phase studies of, up to 2000°C, 6: 209(J)
- Zeeman Lab., Amsterdam
 research programs in spectroscopy and nuclear physics, 6: 1371
- Zinc
 electrolytic separation from U, 6: 90(R)
 spallation products of proton-bombarded, 6: 1864
 spectrophotometric analysis of, 6: 597(R)
- Zinc-aluminum-magnesium alloys
 corrosion of, mechanism of, 6: 248(J)
 photometric analysis of, for Al, 6: 1139
- Zinc complexes
 dissociation of, in aqueous solutions, 6: 564(J)
 with 2-methyl-8-quinolinol, stability of, 6: 1141(J)
 preparation, dissociation constants, and molar absorptivity indexes of, 6: 157
- Zinc-copper alloys
 diffusion in, 6: 603(R)
 grain boundary diffusion in, 6: 1473(R)
- Zinc-copper couples
 diffusion of Zn in, 6: 601(R)
- Zinc-copper-nickel alloys
 casting, corrosion, and physical properties of, 6: 1465
- Zinc isotopes Zn⁶⁴
 gamma absorption cross sections of, 6: 1326
 gamma cross section of, 6: 364
 gamma reactions (γ, n), 6: 1871(J)
- Zinc isotopes Zn⁶⁵
 branching ratio of K capture to positron emission, 6: 427(J)
 decay of, by K capture, 6: 1353(J)
- Zinc isotopes Zn⁶⁶
 energy levels and nuclear spin of, 6: 1015(J)
- Zinc nitrates
 distribution of, between water and 1-hexanol, 6: 102
 solubility in benzene and hexanol, effects of impurities on, 6: 83
- Zinc oxides
 recrystallization and sintering of, mechanism of, 6: 117
 solubility of, effect of pH on, 6: 597(R)
 thermal conductivity of, 6: 204
- Zinc single crystals
 creep mechanism in, 6: 1733
 plastic deformation of, 6: 1470(R)
 recrystallization of, 6: 618(R)
- Zircon
 (See also Zirconium silicates.)
 gravimetric analysis of, for Zr, 6: 113(J)
- Zirconium
 analysis of, 6: 1737(R)
 anodizing of, 6: 225
 cathodic sputtering of, 6: 252
 chemical properties of, review, 6: 99(J)
 combustion analysis of, for C, 6: 592
 corrosion of, by H₃PO₄ aerated with He and by Ac and Na hypochlorite, 6: 1236
 crystal structure of, effects O₂ and N₂ on, 6: 229(R)
 determination of, by precipitation with benzoic acid, 6: 823(J)
 determination of, by precipitation with cinnamic acid, 6: 1146(J)
 determination of, by selenite method, 6: 1636
 deuteron range-energy relation in, 6: 1032
 diffusion of N in, 6: 898
 electrochemical corrosion of, 6: 597(R)
 electrodeposition of, from fused salts, 6: 1173(R)
 electrolysis of, 6: 597(R)
 gravimetric determination of, in zircon, 6: 113(J)
 ion exchange properties of, 6: 86, 1636
 metallography of, with polarized light, 6: 1228
 phase studies and tensile properties of, 6: 1475(R)
 physical properties of iodide refined and crude, 6: 1241(J)
 preparation, melting, casting, and corrosion of, 6: 223(R)
- Zirconium (cont'd.)
 production of, by fused salt electrolysis, 6: 236(R), 1737(R)
 separation of, from Hf, 6: 99(J), 844(J), 1175(J)
 spectrographic determination of, 6: 1144(J)
 spectrophotometric analysis of, for traces of Fe and Ti using tiron, 6: 1656
 surface reaction of, with N, 6: 898
 x-ray spectra, 6: 97(J)
- Zirconium alloys
 with Al, Cr, Cu, Mg, Mo, Si, Sn, W, constitution diagrams of, 6: 591(R)
 corrosion of, by rocket fuels, 6: 1236
- Zirconium borides
 crystal structure and properties of, 6: 120
- Zirconium borohydrides
 preparation of, 6: 467(P)
- Zirconium(IV) chloride complexes
 thermal decomposition of, 6: 1636
- Zirconium chlorides
 compounds with alkyl benzoates, heats of formation of, 6: 1396(J)
 reactions of, with phosphorus oxyhalogens, 6: 1636
- Zirconium(IV) chlorides
 dissociation of, production of Zr metal by, 6: 223(R)
 preparation, purification, and handling of, 6: 275
 vapor pressure of, by molecular effusion, 6: 275
- Zirconium complexes
 preparation, 6: 157
- Zirconium compounds
 organic, preparation and properties of, 6: 1636
- Zirconium foils
 preparation of, for corrosion testing, 6: 234
- Zirconium hydrides
 explosive limits of, 6: 1627
- Zirconium iodides
 physical properties, 6: 229(R)
- Zirconium(IV) iodides
 dissociation of, production of Zr metal by, 6: 223(R)
 preparation of, 6: 223(R)
- Zirconium isotopes
 yields of, in U²³⁵ fission, 6: 1327(J)
- Zirconium isotopes Zr⁸²
 gamma emission from, 6: 419(J)
- Zirconium isotopes Zr⁸³
 preparation of carrier-free, 6: 1422
- Zirconium-magnesium-thorium alloys
 metallurgical properties of, 6: 903(R)
- Zirconium-molybdenum alloys
 crystal structure of, 6: 249(J)
- Zirconium-niobium alloys
 tensile properties of, 6: 1475(R)
- Zirconium oxides
 production of, by chloride decomposition, 6: 1944(P)
 thermal conductivity of, up to 1300°C, 6: 1448(R)
- Zirconium(IV) oxides
 ceramic containing, refractory properties of, 6: 886(P)
 preparation of, from Formosan sands, 6: 892(J)
 refractory properties of, 6: 887(J)
 stabilization of, by rare earth oxides, 6: 209(J)
- Zirconium powders
 explosive limits of, 6: 1627
- Zirconium silicates
 (See also Zircon.)
 ceramic containing, refractory properties of, 6: 886(P)
- Zirconium-tantalum alloys
 phase studies and tensile properties of, 6: 1475(R)
- Zirconium-titanium alloys
 constitution diagrams of, 6: 1229
 corrosion of, by Al chlorides, Na and Ni, 6: 1236
 phase studies of, 6: 233
 properties of, 6: 1229
- Zirconyl chlorides
 electric conductivity of aqueous solutions of, 6: 85
 hydrolysis of, 6: 86
 ion exchange properties of, 6: 86
- Zoe reactor
 (France)
 experimental reactivity curves for, 6: 696(J)
 neutron cross section measurement by oscillation of, 6: 697(J)
 radioisotope production in, 6: 1325(J)

NEW NUCLEAR DATA

Summary of New Nuclear Data on Half Lives, Radiations, Relative Isotopic Abundances, Nuclear Moments, Neutron Cross Sections, Reaction Energies, and Masses

Prepared by National Bureau of Standards Nuclear Data Group with the Assistance of Readers

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In this issue, Nuclear Science Abstracts presents its first cumulation of new nuclear data. The material cumulated here is that which has appeared in the first six numbers of NSA, Vol. 6 and thus consists of a tabular summary of measurements of nuclear constants reported in all journals between roughly July 1, 1951 and December 1, 1951. A few unintentional omissions have been noticed. The items overlooked will appear in succeeding numbers of NSA and will be incorporated in the next cumulation which will appear in NSA, Vol. 6, No. 12B.

ABBREVIATIONS

a	absorption measurement	ic	ionization chamber
$a\beta\gamma$	absorption of β 's in coincidence with γ 's	K/L	α_K/α_L
ace ⁻	absorption of conversion electrons	M	molecular or atomic beam resonance method
a coin	measurement by placing absorbers between counters in coincidence	M1;M2,...	magnetic dipole, magnetic quadrupole
α	total γ -ray conversion coefficient, N_e/N_γ	mb	millibarns
$\alpha_K, \alpha_L, \dots$	γ -ray conversion coefficient for electrons ejected from the K, L, ... shell	Mic	microwave method
b	coefficient in angular correlation function, $1 + b \cos^2 \theta$	mir	measurement by total reflection of neutron beam from mirror surface
B	band spectra method	ms	mass spectrometer
$Be\gamma n$	measurement by detection of photoneutrons from Be	μ	(1) magnetic moment in units of nuclear magnetons, (2) micron, 10^{-4} cm
cc	cloud chamber	μs	microseconds
ce ⁻	conversion electrons	osc	pile oscillator method
chem	chemical separation of product following reaction	para	paramagnetic resonance method
Cpt	Compton electrons	pc	proportional counter
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript	pe ⁻	photo electrons
$D\gamma n, D\gamma p$	measurement by detection of photoneutrons or photoprotons from deuterium	ppl	photoplates or emulsions
EA	electrostatic analyzer	q	electric quadrupole moment in units of barns
E_0	resonance energy	Q	reaction energy in Mev
$E_\beta, E_\gamma, \dots$	energy of β ray, energy of γ ray, ...	s	(1) spectrometer method, (2) seconds, when used as superscript
$E1, E2, \dots$	electric dipole, electric quadrupole ...	S	atomic-spectra measurement
f	fission, in abbreviations for methods of production or detection	scin	scintillation counter
F-K	Fermi-Kurie β energy distribution plot	sl	lens spectrometer
Γ	resonance half-width (the whole width at half-maximum)	sl;ce ⁻	conversion electrons measured in lens spectrometer
ι	(1) spin in units of $\hbar/2\pi$; (2) nuclear induction magnetic resonance method	st	strong
		$s\pi$	180° spectrometer
		$s\pi \sqrt{2}$	double focusing spectrometer
		σ	cross section in barns
		σ_0	cross section at resonance energy, E_0
		σ_a	absorption cross section
		σ_{el}	elastic scattering cross section

NEW NUCLEAR DATA

σ_{in}	inelastic scattering cross section	τ	half life in units indicated
σ_s	scattering cross section	$\beta\gamma, \gamma\gamma$	$\beta\gamma$ or $\gamma\gamma$ coincidences
σ_t	total cross section	$\beta\gamma(\theta)$	angular correlation of β 's and γ 's in coincidence
t	triton, H^3	$d, p(\theta)$	angular distribution of protons with respect to deuteron beam
th	thermal		
w, vw	weak, very weak		

Standard journal abbreviations are used.

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

NEW NUCLEAR DATA

o_n^1	τ 13 ^m β^- 0.782 $p\beta^-$ coincidences	sl	J. M. Robson, <u>Phys. Rev.</u> 83 , 349(1951). F-K plot linear.	${}_2He^4$	No large resonance in $H^3(p, \gamma)$ for $E_p < 3.4$ scin	C. E. Falk, G. C. Phillips, <u>Phys. Rev.</u> 83 , 468(1951).
H	$\sigma_t(14 \text{ Mev})$ 0.68 $\sigma_t(14.2 \text{ Mev})$ 0.68 $\sigma_t(14.1 \text{ Mev})$ 0.689 $\sigma_t(156 \text{ Mev})$ 0.046		L. S. Goodman, ANL-4602 (Mar. 1951). D. I. Meyer and W. Nyer, LA-1279 (July 1951). H. L. Poss et al., BNL-117 (June 1951). A. E. Taylor et al., <u>Phil. Mag.</u> 42 , 751(1951).	Li	γ 20.4 $\pm$ 0.2 $H^3(p, \gamma)$ s $\sigma_t(1.3 - 3.4 \text{ Mev})$ graph $\sigma_t(0.15 - 0.40 \text{ Mev})$ graph	R. S. Rochlin, <u>Phys. Rev.</u> 84 , 165(1951). C. K. Bockelman et al., <u>Phys. Rev.</u> 84 , 69(1951). P. H. Stelson, W. M. Preston, <u>Phys. Rev.</u> 84 , 162(1951).
${}_1H_0^1$	μ 1.52101 $\pm$ 0.00002 $\times 10^{-3}(\text{eh}/4\pi\text{mc})$		J. H. Gardner, <u>Phys. Rev.</u> 83 , 996(1951). Diamag. corr.	${}_3Li_3^6$	Level 2.187 Be(p, α) EA	C. P. Browne et al., <u>Phys. Rev.</u> 83 , 179 (1951).
${}_1H_1^2$	$\sigma_t(14.2 \text{ Mev})$ 0.81 $\sigma_t(156 \text{ Mev})$ 0.0707 μ 0.857615* 0.857611** * $\nu_D/\nu_H = 0.15350733$ ± 0.00000007 ** $\nu_D/\nu_H = 0.15350669$ ± 0.00000012 μ 0.857608 $\nu(D)/\nu(H) = 0.15350612$ ± 0.00000005	I	D. I. Meyer and W. Nyer, LA-1279 (July 1951). A. E. Taylor et al., <u>Phil. Mag.</u> 42 , 751(1951). G. Lindström, <u>Arkiv Fysik</u> 4 , 1(1951). * D_2O ; paraffin oil ** D_2O ; H_2O .	${}_3Li_4^7$	μ 3.2568 I $\nu(Li)/\nu(H) = 0.3886341$ ± 0.0000010 $p(\theta)$ ppl Li ⁶ (d, p) I(0.477 level) = $\frac{1}{2}$ Li ⁶ (d, p γ) p $\gamma(\theta)$ indicates I = $\frac{1}{2}$ for 0.477 level	G. Lindström, <u>Arkiv Fysik</u> 4 , 1(1951). [LiNO ₃]. D. N. Dunbar, F. Hirst, <u>Phys. Rev.</u> 83 , 164(1951). J. O. Newton, <u>Proc. Phys. Soc. (London)</u> 64A , 938(1951). C. M. Class and S. S. Hanna, <u>Nature</u> 168 , 429(1951).
${}_1H_2^3$	τ 12.4 ^y β^- 0.0194 $\pm$ 0.0004 Neutrino mass $\leq 250 \text{ ev}$ β^- intensity below 1 kev less than expected		W. M. Jones, <u>Phys. Rev.</u> 83 , 537(1951). D. R. Hamilton et al., <u>Phys. Rev.</u> 83 , 215A (1951). G. M. Insch, S. C. Curran, <u>Phil. Mag.</u> 42 , 892(1951).		Level 0.48 Li(d, d) Levels 0.4782 Li ⁷ (p, p) 0.4775 Li ⁷ (d, d)	F. B. Shull, <u>Phys. Rev.</u> 83 , 875A(1951). R. M. Williamson et al., <u>Phys. Rev.</u> 84 , 731 (1951).
${}_1H_3^4$	No β 's after $H^3(3.8 \text{ Mev } d)$ Yield $H^3(d, n)/H^3(d, p)$ > 1500 $E_d = 0.5$ to 3.8		K. G. McNeill and W. Rall, <u>Phys. Rev.</u> 83 , 1244(1951).	${}_3Li_5^8$	Level 4.62 Be ⁹ (d, α) No 4.8 γ Li(p, p) scin	R. W. Gelinas et al., <u>Phys. Rev.</u> 83 , 1260(1951). H. E. Gove, <u>Phys. Rev.</u> 84 , 1059(1951).
He	σ_s coh 1.1		A. W. McReynolds, <u>Phys. Rev.</u> 84 , 969 (1951). Assuming $\sigma_s \text{ coh}(O) = 4.2$		τ 0.825 ^s Li(4 Mev d, p) scin $\beta^- \sim 2\%$ < 13 a $\beta\gamma$ to 4.8 level of Be ⁹ ? Level 2.2 Li ⁷ (n, n) $\Gamma = 0.040$ J = 3	G. Vendryes, <u>Compt. rend.</u> 233 , 391(1951). P. H. Stelson and W. M. Preston, <u>Phys. Rev.</u> 84 , 162(1951).

${}^3\text{Li}^9$	τ 0.168 ^s Delayed n's	W. L. Gardner et al., Phys. Rev. 83, 1054(1951). Be(19 Mev d,2p) and B,C,N(d and p).	${}^5\text{B}^{10}$	$\sigma_t(0 - 3.4 \text{ Mev})$ graph Maxima: 1.8, 2.8 $\sigma_{(n,\alpha)}$ $E_n = 0.3$ to 2.5 graphs	C. K. Bockelman et al., Phys. Rev. 84, 69(1951). B. Petree et al., Phys. Rev. 83, 1148(1951).
Be	$\sigma_t(1.3 - 3.4 \text{ Mev})$ graph $\sigma_t(156 \text{ Mev})$ 0.26	C. K. Bockelman et al., Phys. Rev. 84, 69(1951). A. E. Taylor et al., Phil. Mag. 42, 751(1951).		No 1.73 γ $\text{Be}^9(\text{d,n})$ sl;pe ⁻ n yield $\text{Be}^9(\text{d,n})$ increase at $E_d = 0.91$, 2.3? $E_d = 0 - 3.5$.	D. E. Alburger, Phys. Rev. 83, 184(1951). E. B. Tucker, Phys. Rev. 83, 473(1951).
${}^4\text{Be}_3^7$	K(0.479 level)/ K(ground) = 0.123 from data of 49T6	J. M. Dickson and T. C. Randle, Proc. Phys. Soc. (London) 64A, 902(1951).	${}^5\text{B}^{11}$	μ 2.6887 I $\nu(\text{B})/\nu(\text{H}) = 0.3208381$ ± 0.0000008 γ 's $\text{B}^{10}(\text{d,p})$ 4.43 7.34 } 6.75 8.93 } pair s	G. Lindström, Arkiv Fysik 4, 1(1951). [Na ₂ B ₂ O ₄] and [K ₂ B ₂ O ₄]. S. J. Bame, L. M. Baggett, Phys. Rev. 84, 891(1951). $E_d =$ 1.4.
${}^4\text{Be}_4^8$	τ $< 5 \times 10^{-14}$ s $\text{O}^{16}(\gamma, 4\alpha)$ stars Pair emitting level ~ 7 $\text{B}^{11}(7.9 \text{ p}, \alpha)$	J. J. Wilkins and F. K. Goward, Proc. Phys. Soc. (London) A64, 849(1951). G. C. Phillips et al., Phys. Rev. 83, 1049(1951).		Levels $\text{B}^{10}(\text{d,p})$ p γ coincidences rates Level $\text{Be}^9(\alpha, \text{d})$ 2 18 a al	H. H. Landon, Phys. Rev. 83, 1081(1951). W. O. McMinn et al., Phys. Rev. 84, 963 (1951).
	Level $\text{C}^{12}(\gamma, 3\alpha)$ 16.9 ppl	J. J. Wilkins, F. K. Goward, Proc. Phys. Soc. (London) 64A, 1056 (1951).		Levels $\text{B}^{10}(\text{d,p})$ 4.50, 6.4* } 6.7, 8.88 } pair s	J. G. Rutherglen et al., Proc. Phys. Soc. (London) 64A, 906(1951). *In C^{11} ?
	Level $\text{Li}^7(\text{p,n})\text{Be}^7$ 18.90?	T. W. Bonner and J. W. Butler, Phys. Rev. 83, 1091(1951).	${}^5\text{B}^{12}$	τ 0.027 ^s β^- 4% ~ 9.1 a $\beta\gamma$	J. E. Brolley, Jr., et al., Phys. Rev. 83, 990(1951). G. Vendryes, Compt. rend. 233, 391(1951).
	$\alpha(\theta)$ found $\text{Li}^6(\text{d}, \alpha)$ for $E_d = 0.2 - 1$ ppl	D. N. Dunbar, F. Hirst, Phys. Rev. 83, 164(1951).		Levels $\text{Be}^9(\alpha, \text{p})$ 0.95, 1.65, 3.82 - a al	W. O. McMinn et al., Phys. Rev. 84, 963 (1951).
${}^4\text{Be}_5^9$	I $\frac{3}{2}$ I q $\sim 0.02?$	J. Hatton et al., Phys. Rev. 83, 672 (1951). [Be ₃ Al ₂ Si ₆ O ₁₈].		Levels $\text{B}^{11}(\text{n}, \gamma)$ 4.46 130 J 4.92 65 3 5.53 120 2 5.63 60 3	C. K. Bockelman et al., Phys. Rev. 84, 69(1951).
	n(θ) $\text{Be}^9(\text{d,n})$ I(ground) = ($\frac{3}{2}$)-	L. Schecter, Phys. Rev. 83, 695(1951).		$\sigma_t(1.3 - 3.4 \text{ Mev})$ graph	C. K. Bockelman et al., Phys. Rev. 84, 69(1951).
	Level $\text{Be}^9(\alpha, \alpha)$ 2.63 a al	W. O. McMinn et al., Phys. Rev. 84, 963 (1951).		$\sigma_t(14 \text{ Mev})$ 1.14 $\sigma_t(14.2 \text{ Mev})$ 1.29	L. S. Goodman, ANL- 4602 (Mar. 1951). D. I. Meyer and W. Nyer, LA-1279 (July 1951).
	Level $\text{Be}^9(\text{p,p})$ 2.433 EA	C. P. Browne et al., Phys. Rev. 83, 179 (1951).		$\sigma_t(14.1 \text{ Mev})$ 1.279 $\sigma_t(156 \text{ Mev})$ 0.330	H. L. Poss et al., BNL-117 (June 1951). A. E. Taylor et al., Phil. Mag. 42, 751(1951).
${}^4\text{Be}_{10}^{10}$	Level $\text{Be}^9(\text{d,p})$ 3.34 ppl	A. J. Salmon, Proc. Phys. Soc. (London) A64, 848(1951).	C	$\sigma_t(1.3 - 3.4 \text{ Mev})$ graph	C. K. Bockelman et al., Phys. Rev. 84, 69(1951).
B	$\sigma_a(\text{th n})$ 730 osc	H. Pomerance, Phys. Rev. 83, 641(1951).		$\sigma_t(14 \text{ Mev})$ 1.14 $\sigma_t(14.2 \text{ Mev})$ 1.29	L. S. Goodman, ANL- 4602 (Mar. 1951). D. I. Meyer and W. Nyer, LA-1279 (July 1951).
	$\sigma_t(0.9 - 3.4 \text{ Mev})$ graph	C. K. Bockelman et al., Phys. Rev. 84, 69(1951) See also B^{12} .		$\sigma_t(14.1 \text{ Mev})$ 1.279 $\sigma_t(156 \text{ Mev})$ 0.330	H. L. Poss et al., BNL-117 (June 1951). A. E. Taylor et al., Phil. Mag. 42, 751(1951).
${}^5\text{B}_5^{10}$	Level $\text{C}^{12}(\text{d}, \alpha)$ 0.71 s	A. Ashmore, J. F. Raffle, Proc. Phys. Soc. (London) 64A, 754 (1951).	${}^6\text{C}^{11}$	τ 20.0 ^m	J. M. Dickson and T. C. Randle, Proc. Phys. Soc. (London) 64A, 902(1951).
	Levels $\text{Be}(\text{d,n})$ 5.110, 5.163, 5.924	T. W. Bonner and J. W. Butler, Phys. Rev. 83, 1091(1951).			

${}^6\text{C}_{12}^{13}$	γ 4.37 ~2.5 γ /4.4 γ <0.3 ~7 γ /4.4 γ <0.002	Be(α ,n) pair s	K. P. Artemov, N. A. Viasov, Doklady Akad. Nauk S.S.S.R. 77, 225 (1951) in Guide to Russ. Sci. Per. Lit. 4, 235(1951).	${}^7\text{N}_7^{14}$	Levels 3.98, 5.06	O ¹⁶ (d, α) ppl	H. B. Burrows et al., Proc. Roy. Soc. (London) 209A, 478 (1951).
	Level 4.44	B ¹¹ (d,n) pair s	J. G. Rutherglen et al., Proc. Phys. Soc. (London) 64A, 906(1951).		Levels 11.29, 11.43, 11.76, 11.88, 11.96, 12.10, 12.15, 12.33, 12.49	C ¹⁴ (p,n)N ¹⁴	W. D. Roseborough et al., Phys. Rev. 83, 1133(1951).
	n yield increase at E _d = 1.3 E _d = 0 - 3.5.	B ¹¹ (d,n)	E. B. Tucker, Phys. Rev. 83, 473(1951).		O σ_t (1.2 - 3.5 Mev) graph σ_t (14 Mev) 1.49 σ_t (14.2 Mev) 1.61 σ_t (156 Mev) 0.430		C. K. Bockelman et al., Phys. Rev. 84, 69(1951). L. S. Goodman, ANL-4602 (Mar. 1951). D. I. Meyer and W. Nyer, LA-1279 (July 1951). A. E. Taylor et al., Phil. Mag. 42, 751(1951).
	E _d ~ 27	C ¹² (γ ,3 α) ppl	J. J. Wilkins, F. K. Goward, Proc. Phys. Soc. (London) 64A, 1056 (1951).				
${}^6\text{C}_{13}^{13}$	Level 3.05	C ¹² (d,p) pair s	L. M. Baggett and S. J. Bame, Jr., Phys. Rev. 84, 154(1951).	${}^8\text{O}_9^{17}$	Levels 0.87 5.31 7.51 3.06 5.76 8.27 3.85 6.24 8.59 4.58 6.89 9.06 5.07	O ¹⁶ (d,p) F ¹⁹ (d, α) ppl	H. B. Burrows et al., Proc. Roy. Soc. (London) 209A, 478 (1951).
	Levels 3.683 $\frac{1}{2}$ or $\frac{3}{2}$,- 3.884 $\frac{3}{2}$ or $\frac{5}{2}$,+	C ¹² (d,p)	J. Rotblat, Phys. Rev. 83, 1271(1951) d,p(θ); ppl. E _d = 8.		Levels 5.69 ≤ 7 $\geq \frac{3}{2}$ 5.86 ≤ 10 $\geq \frac{3}{2}$ 5.93 30 $\frac{1}{2}$ 6.36 120 $\frac{1}{2}$	O ¹⁶ (n, γ) J	C. K. Bockelman et al., Phys. Rev. 84, 69(1951).
		C ¹² (n, γ) Levels Γ (keV) J 6.80 ≤ 11 $\geq \frac{3}{2}$ 7.60 120 $\frac{3}{2}$	C. K. Bockelman et al., Phys. Rev. 84, 69(1951).				
${}^6\text{C}_{14}^{14}$	Level 6.10	C ¹³ (d,p) pair s	L. M. Baggett and S. J. Bame, Jr., Phys. Rev. 84, 154(1951).	${}^9\text{F}_8^{17}$	No γ		V. Perez-Mendez, P. Lindenfeld, Phys. Rev. 83, 864(1951).
					dn(θ) ppl I(0.536 level) = $\frac{1}{2}$	O ¹⁶ (d,n)	F. Ajzenberg, Phys. Rev. 83, 693 and 875A(1951).
					d,n(θ) I(0.53 level) = $\frac{1}{2}$ + I(ground) = $\frac{3}{2}$ +, $\frac{5}{2}$ +	O ¹⁶ (d,n)	F. A. El-Bedawi et al., Proc. Phys. Soc. (London) 64A, 757 (1951).
					Levels 3.11 3.88 4.36 4.73	O ¹⁶ (p,p or γ) J S $\frac{1}{2}$ f $\frac{1}{2}$ d $\frac{3}{2}$ p $\frac{3}{2}$	R. A. Laubenstein et al., Phys. Rev. 84, 12, 18(1951).
${}^7\text{N}_8^{13}$	d,n(θ) I(3.53 level) = $\frac{1}{2}$ +, $\frac{3}{2}$ + I(2.38 level) = $\frac{1}{2}$ + I(ground) = $\frac{1}{2}$ -, $\frac{3}{2}$ -	C ¹² (d,n)	F. A. El-Bedawi et al., Proc. Phys. Soc. (London) 64A, 1055 (1951).	${}^9\text{F}_9^{18}$	β^- 100% 0.649 No γ	sl	L. Ruby, J. R. Richardson, Phys. Rev. 83, 698(1951). F ¹⁹ (p,pn).
	n(θ) I(ground) = $\frac{1}{2}$ - or $\frac{3}{2}$ -	C ¹² (d,n)	W. Heckrotte, L. Schecter, Phys. Rev. 83, 894A(1951).		Levels 1.05 2.61 4.42 1.83 3.23 5.01 2.20 3.92 5.61	Ne ²⁰ (d, α) ppl	R. Middleton, C. T. Tai, Proc. Phys. Soc. (London) A64, 801(1951).
	Resonances E ₀ = 0.45, 1.700 $\pm$ 0.008	C ¹² (p, γ)	J. D. Seagrave, Phys. Rev. 83, 887A(1951); 84, 1219(1951).		μ 2.6282* 2.6284**	I	G. Lindström, Arkiv Fysik 4, 1(1951). *[CHFC ₁₂], **[CFC ₁₃]. Ratio different for six compounds tested.
	Levels 3.40 5.04	C ¹³ (d,n) pair s	L. M. Baggett and S. J. Bame, Jr., Phys. Rev. 84, 154(1951).		ν (F)/ ν (H) = 0.9408545* $\pm$ 0.0000030 ν (F)/ ν (H) = 0.9409330** $\pm$ 0.0000030		
${}^7\text{N}_7^{14}$	Levels 3.95, 5.01, 5.70	O ¹⁶ (d, α) s	A. Ashmore, J. F. Raffle, Proc. Phys. Soc., (London) 64A, 754 (1951).	${}^9\text{F}_{10}^{19}$			

${}^9\text{F}_{10}^{19}$	μ	2.62807	I	T. Kanda et al., <u>Phys. Rev.</u> 83 , 1066(1951).	Mg	$\sigma_t(0.01 - 0.8 \text{ Mev})$ graph			R. E. Fields, M. Walt, <u>Phys. Rev.</u> 83 , 479 (1951).
	Levels	$\text{O}^{18}(\alpha, p)$		M. L. Bullock, M. B. Sampson, <u>Phys. Rev.</u> 84 , 967(1951).		E_0	σ_0	J	
	1.36, 2.67, 3.92	a al				0.085	23	$\frac{1}{2}$	
						0.275	13	$\frac{1}{2}$	
${}^9\text{F}_{11}^{20}$	Level	$\text{F}^{19}(\text{d}, \text{d})$		F. B. Shull, <u>Phys. Rev.</u> 83 , 875A(1951).	${}^{12}\text{Mg}_{11}^{23}$	τ	12.3 ^s		F. I. Boley, D. J. Zaffarano, <u>Phys. Rev.</u> 84 , 1059(1951)
	1.52					β^+	2.99	scin	
	Level	$\text{Ne}^{22}(\text{d}, \alpha)$		R. Middleton, C. T. Tai, <u>Proc. Phys. Soc. (London)</u> A64 , 801(1951).		Level			
	0.57	ppl				0.584 s			
${}^9\text{F}_{11}^{20}$	Levels	$\text{F}^{19}(\text{d}, p)$		H. B. Burrows et al., <u>Proc. Roy. Soc. (London)</u> 209A , 478 (1951).	${}^{12}\text{Mg}_{13}^{25}$	Levels			B. B. Kinsey et al., <u>Phys. Rev.</u> 83 , 519 (1951).
	0.63 2.55 4.06					Mg(n, γ)			
	0.83 2.91 4.31	ppl				11 capture γ 's pair s			
	1.00 3.49 4.73					Levels			
${}^9\text{F}_{11}^{20}$	Q's	$\text{F}^{19}(\text{d}, p)$		F. B. Shull, <u>Phys. Rev.</u> 83 , 875A(1951).	${}^{12}\text{Mg}_{14}^{26}$	Levels			B. B. Kinsey et al., <u>Phys. Rev.</u> 83 , 519 (1951).
	4.55, 3.86, 3.57, 2.35, 1.85, 1.43, 0.81, 0.14					Mg(n, γ)			
						5 capture γ 's pair s			
${}^{10}\text{Ne}_9^{19}$	τ	18.5 ^s		G. E. Schrank, J. R. Richardson, <u>Phys. Rev.</u> 83 , 891A(1951).	Al	$\sigma_t(14 \text{ Mev})$			L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).
	β^+	2.16	s π	F(p, n).		1.67			
						$\sigma_t(156 \text{ Mev})$			
						0.68			
${}^{10}\text{Ne}_{10}^{20}$	Resonances for $\text{O}^{16}(\pi)$			G. C. Phillips, N. P. Heydenburg, <u>Phys. Rev.</u> 83 , 184(1951).	${}^{13}\text{Al}_{12}^{25}$	Levels			F. P. Mooring et al., <u>Phys. Rev.</u> 83 , 219A (1951).
	$\text{F}^{19}(\text{p}, \alpha)$					9 levels for $E_p = 0.4 - 3.9$			
	E_0	$\Gamma(\text{kev})$				$\text{Mg}^{24}(\text{p}, \text{p})$			
	0.710	35				$\text{Mg}^{24}(\text{p}, 2\text{pn})\text{Na}^{22}$			
${}^{10}\text{Ne}_{10}^{20}$	n yield	$\text{F}^{19}(\text{d}, n)$		E. B. Tucker, <u>Phys. Rev.</u> 83 , 473(1951).	${}^{13}\text{Al}_{13}^{26}$	$E_p \leq 92$			J. W. Meadows, R. B. Holt, <u>Phys. Rev.</u> 83 , 1257(1951).
	increase at $E_d = 1.3$					yield curve, σ			
	$E_d = 0 - 3.5$.					$E_p \leq 92$			
						yield curve, σ			
${}^{10}\text{Ne}_{11}^{21}$	Levels	$\text{Ne}^{20}(\text{d}, p)$		R. Middleton, C. T. Tai, <u>Proc. Phys. Soc. (London)</u> A64 , 801(1951). *Isotopic assignment uncertain.	${}^{13}\text{Al}_{14}^{27}$	μ	3.6394	I	G. Lindström, <u>Arkiv Fysik</u> 4 , 1(1951).
	0.33 4.71 7.30					$\nu(\text{Al})/\nu(\text{H}) = 0.2605694 \pm 0.0000010$			
	1.68 5.44 8.28					Levels			
	2.79 5.74 8.91					0.97 4.74			
${}^{10}\text{Ne}_{13}^{23}$	Q's	$\text{Ne}^{22}(\text{d}, p)$		R. Middleton, C. T. Tai, <u>Proc. Phys. Soc. (London)</u> A64 , 801(1951). *Isotopic assignment uncertain.	${}^{13}\text{Al}_{15}^{28}$	2.39 5.76			K. K. Keller, <u>Phys. Rev.</u> 84 , 884(1951).
	1.17, -0.04*					3.17 s			
						$\text{Mg}^{26}(\text{p}, 2\text{p}3\text{n})\text{Na}^{22}$			
						$E_p \leq 92$			
${}^{11}\text{Na}_{10}^{21}$	τ	22.8 ^s		G. E. Schrank, J. R. Richardson, <u>Phys. Rev.</u> 83 , 891A(1951).	${}^{13}\text{Al}_{15}^{28}$	β^-			H. T. Motz, <u>Phys. Rev.</u> 83 , 215A(1951) and *verbal report.
	β^+	<2.50?	s π	Mg(p, α).		2.84*			
	γ	~1.5	scin			1.78 sl; pe ⁻			
						Level			
${}^{11}\text{Na}_{12}^{23}$	μ	2.2167	I	G. Lindström, <u>Arkiv Fysik</u> 4 , 1(1951).	${}^{13}\text{Al}_{15}^{28}$	0.031			H. Enge et al., <u>Phys. Rev.</u> 83 , 31(1951).
	$\nu(\text{Na})/\nu(\text{H}) = 0.2645182 \pm 0.0000007$					Al(d, p)			
						γ of 0.031			
						pc, a, scin			
${}^{11}\text{Na}_{13}^{24}$	γ	0.04% ~3.7 ic		L. E. Beghian et al., <u>Phys. Rev.</u> 83 , 186 (1951).	${}^{13}\text{Al}_{15}^{28}$	Levels			R. D. Smith, R. A. Anderson, <u>Nature</u> 168 , 429(1951).
	4.1 γ /disintegration <10 ⁻⁶					1.04 3.98 6.40			
	Levels	Na(n, γ)		B. B. Kinsey et al., <u>Phys. Rev.</u> 83 , 519 (1951).		1.58 4.83 6.90			
	7 capture γ 's	pair s				2.17 5.16 7.40			
${}^{11}\text{Na}_{13}^{24}$					${}^{13}\text{Al}_{15}^{28}$	2.52 5.80 8.50			K. K. Keller, <u>Phys. Rev.</u> 84 , 884(1951).
						3.47 6.10			
						s			

$^{13}\text{Al}^{28}_{15}$	Levels 29 capture γ 's	Al(n, γ) pair s	B. B. Kinsey et al., Phys. Rev. <u>83</u> , 519 (1951).	$^{17}\text{Cl}^{33}_{16}$	τ 1.8 ^s β^+ 4.43	scin	D. J. Zaffarano, F. I. Boley, Phys. Rev. <u>83</u> , 223(A)(1951) and <u>84</u> , 1059(1951).
Si	$\sigma_t(0.01 - 0.8 \text{ Mev})$ $\frac{E_0}{0.195}$ $\frac{\sigma_0}{12}$ $\frac{J}{\frac{1}{2}}$ 0.570 8 $> \frac{1}{2}$	graph	R. E. Fields, M. Walt, Phys. Rev. <u>83</u> , 479 (1951).	$^{17}\text{Cl}^{34}_{17}$	γ 1.16 2.10 3.22	scin	H. K. Ticho, Phys. Rev. <u>84</u> , 847(1951). Cl(18 Mev p,pn).
$^{14}\text{Si}^{27}_{13}$	τ 5.4 ^s β^+ 3.48	scin	F. I. Boley, D. J. Zaffarano, Phys. Rev. <u>84</u> , 1059(1951).	$^{17}\text{Cl}^{35}_{18}$	q coupling ratio Cl ³⁵ /Cl ³⁷ 1.268 [p-C ₆ H ₄ Cl ₂]		M. Buyle-Bodin and D. Dautreppe, Compt. rend. <u>233</u> , 1101(1951).
$^{14}\text{Si}^{28}_{14}$	n(θ) J* 2 or 3+	Al(d,n)	L. Schecter, Phys. Rev. <u>83</u> , 695(1951). *Spin of Si ²⁸ excited.		q(Cl ³⁵)/q(Cl ³⁷) = 1.2688		H. G. Dehmelt and H. Krüger, Z. Physik <u>129</u> , 401(1951).
	Levels 7.6, 10.46 12.12	Al ²⁷ (p, γ) pair s	J. G. Rutherglen et al., Proc. Phys. Soc. (London) <u>64A</u> , 906(1951).		q coupling ratio Cl ³⁵ /Cl ³⁷ = 1.2686 M ± 0.0004 $\mu(\text{Cl}^{35})/\mu(\text{Cl}^{37}) = 1.20136$ ± 0.00005		V. Jaccarino, J. G. King, Phys. Rev. <u>83</u> , 471(1951)
	Al(p;p, α , γ) yield curves	E _p = 1.4-4	F. C. Shoemaker et al., Phys. Rev. <u>83</u> , 1011(1951).	$^{17}\text{Cl}^{36}_{19}$	I 2 q -0.0168	Mic Mic	C. M. Johnson, W. Gordy, Phys. Rev. <u>83</u> , 1249(1951).
$^{14}\text{Si}^{29}_{15}$	μ -0.55492* assumed I = $\frac{1}{2}$	I	S. S. Dharmatti, H. E. Weaver, Jr., Phys. Rev. <u>84</u> , 843(1951). *Based on $\mu(\text{H}^1) =$ 2.7934; $\nu(\text{H}^2)/\nu(\text{H}^1) =$ 0.153506; $\nu(\text{Na}^{23})/\nu(\text{H}^1) =$ 0.26450.	$^{17}\text{Cl}^{36}_{19}$	Cl(th n, γ) E γ = 5.5, 6.2 Other peaks	scin	B. Hamermesh, V. Hummel, Phys. Rev. <u>83</u> , 663(1951).
	Levels 8 capture γ 's	Si(n, γ) pair s	B. B. Kinsey et al., Phys. Rev. <u>83</u> , 519 (1951).	A	σ_s coh 0.5		A. W. McReynolds, Phys. Rev. <u>84</u> , 969 (1951). Assuming σ_s coh(O) = 4.2.
$^{14}\text{Si}^{29}_{15}$	μ 0.55 assuming I = $\frac{1}{2}$	I	J. Hatton et al., Phys. Rev. <u>83</u> , 672(1951). [Be ₃ Al ₂ Si ₆ O ₁₈].	$^{18}\text{A}^{36}_{18}$	Cl ³⁵ (p, γ) yield curve		K. J. Broström et al., Phys. Rev. <u>83</u> , 1265(1951).
$^{14}\text{Si}^{30}_{16}$	Levels 7 capture γ 's	Si(n, γ) pair s	B. B. Kinsey et al., Phys. Rev. <u>83</u> , 519 (1951).	$^{18}\text{A}^{38}_{20}$	Cl ³⁷ (p; γ ,n, α) yield curves		K. J. Broström et al., Phys. Rev. <u>83</u> , 1265(1951).
	Levels 2.3, 3.6, 4.9	Al(α ,p) from py	H. H. Landon, Phys. Rev. <u>83</u> , 1081(1951).	$^{18}\text{A}^{39}_{21}$	τ 2.4 ^m		M. Hoffman, Phys. Rev. <u>83</u> , 215A(1951).
$^{15}\text{P}^{32}_{17}$	Continuous γ spectrum $\gamma(E_\gamma > 0.09)/\beta^- = 0.0024$		L. Madansky, F. Rasetti, Phys. Rev. <u>83</u> , 187(1951).	$^{18}\text{A}^{42}_{24}$	τ >200 ^d p 12.4 ^h K		S. Katcoff, BNL-117 (June 1951). A(n).
$^{15}\text{P}^{33}_{18}$	τ 25 ^d β^- 0.26 (0.5 Mev γ)/ $\beta^- < 0.07$	a,sl	R. K. Sheline et al., Phys. Rev. <u>83</u> , 919(1951). S,Cl(≤ 48 Mev γ)	$^{19}\text{K}^{37}_{18}$	τ 1.2 ^s β^+ 4.57	scin	F. I. Boley, D. J. Zaffarano, Phys. Rev. <u>84</u> , 1059(1951).
$^{16}\text{S}^{31}_{16}$	τ 3.2 ^s β^+ 4.06	scin	D. J. Zaffarano, F. I. Boley, Phys. Rev. <u>83</u> , 223(A)(1951) and <u>84</u> , 1059(1951).	$^{19}\text{K}^{38}_{19}$	τ 7.7 ^m β^+ 2.8 γ	s	D. Green, J. R. Richardson, Phys. Rev. <u>83</u> , 891A(1951). K(18 Mev p).
$^{16}\text{S}^{33}_{17}$	μ 0.64290 $\nu(\text{S}^{33})/\nu(\text{N}^{14}) = 1.06174$ ± 0.00014	I	S. S. Dharmatti, H. E. Weaver, Phys. Rev. <u>83</u> , 845(1951). [CS ₂].	$^{19}\text{K}^{40}_{21}$	β^- 1.28 $\Delta I = 4$, yes shape β^- 's/sec(gm of K) = 27.1 γ (Auger e ⁻) coinci- dences	scin	M. L. Good, Phys. Rev. <u>83</u> , 1054(1951).
$^{16}\text{S}^{35}_{19}$	β^- 0.167 F-K plot linear to 0.032	sl	R. B. Heller et al., Phys. Rev. <u>83</u> , 848 (1951).				M. Paganelli, G. Quarenì, Nuovo cimento <u>8</u> , 598(1951).

$^{42}_{19}\text{K}$	$\beta\gamma(\theta)$ indicates $I = 2+$ for 1.51 level of Ca^{42} $b = -0.055$ for $E_\beta = 1.23$		D. T. Stevenson, M. Deutsch, <u>Phys. Rev.</u> 84 , 1071(1951).	$^{55}_{26}\text{Fe}$	$E_{\text{dis}} = 0.21$ From continuous γ endpoint	scin	D. Maeder and P. Preiswerk, <u>Phys. Rev.</u> 84 , 595(1951).
$^{39}_{20}\text{Ca}$	$\tau = 1.1^{\text{p}}$ $\beta^+ = 5.13$	scin	F. I. Boley, D. J. Zaffarano, <u>Phys. Rev.</u> 84 , 1059(1951); 83 , 223A(1951).	$^{57}_{26}\text{Fe}$	$\text{Fe}(\text{th } n, \gamma)$ $E_\gamma = 6.0, 7.4, 8.6(\text{Fe}^{58}?)$ No line at 1.4.	scin	B. Hamermesh, V. Hummel, <u>Phys. Rev.</u> 83 , 663(1951).
Ti	$\sigma_t(14 \text{ Mev}) = 2.25$		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).	$^{59}_{26}\text{Fe}$	$\tau = 45.1^{\text{d}}$	pc	R. P. Schuman and A. Camilli, <u>Phys. Rev.</u> 84 , 158(1951).
$^{51}_{22}\text{Ti}$	$\gamma = 0.32$	scin	E. der Mateosian, <u>Phys. Rev.</u> 83 , 223A(1951).		$\tau = 47.1 \pm 0.5^{\text{d}}$		J. Tobailen, <u>Compt. rend.</u> 233 , 1360(1951). Differential ic's.
V	$\sigma_{\text{sc}} = 0.028 (+)$	mir	A. W. McReynolds, R. J. Weiss, <u>Phys. Rev.</u> 83 , 171(1951).	Co	$\sigma_t(0.08 - 1.0 \text{ Mev})$ graph		K. C. Mann, G. H. Hanson, <u>Phys. Rev.</u> 83 , 893A(1951). $\text{Fe}(n, \gamma)$.
	$\sigma_s(0.0017 \text{ ev}) = 6$ $\sigma_t(0.0017 \text{ ev}) = 4.7$		P. A. Egelstaff, <u>Nature</u> 168 , 290(1951).		Resonance $E_0 \sim 3600^* \text{ ev}$		W. F. Stubbins, <u>Phys. Rev.</u> 84 , 902(1951).
	$\sigma_t(14 \text{ Mev}) = 2.38$		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).		Resonances (ev) $\frac{E_0}{126} \quad \frac{\sigma_0}{9100^*} \quad \frac{\Gamma}{5.0^*}$ 5000		S. P. Harris, <u>Phys. Rev.</u> 83 , 235A(1951) and *verbal report.
$^{51}_{23}\text{V}$	Resonance $E_0 \sim 3300 \text{ ev}$		S. P. Harris, <u>Phys. Rev.</u> 83 , 235A(1951).		$\beta\gamma(\theta) = \text{const.}$		W. W. Havens, Jr., and L. J. Rainwater, <u>Phys. Rev.</u> 83 , 1123(1951). *Assuming $\Gamma_n \gg \Gamma_\gamma$.
	$I = \frac{1}{2}$	para	B. Bleaney et al., <u>Proc. Phys. Soc. (London)</u> 64A , 601(1951).	$^{55}_{27}\text{Co}$	$\beta\gamma(\theta) = \text{const.}$		D. T. Stevenson and M. Deutsch, <u>Phys. Rev.</u> 83 , 1202(1951).
Cr	$\sigma_t(14 \text{ Mev}) = 2.33$		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).	$^{56}_{27}\text{Co}$	$\beta\gamma(\theta) = \text{const.}$		D. T. Stevenson and M. Deutsch, <u>Phys. Rev.</u> 83 , 1202(1951).
Mn	$\sigma_t(0.08 - 1.0 \text{ Mev})$ graph		W. F. Stubbins, <u>Phys. Rev.</u> 84 , 902(1951).	$^{59}_{27}\text{Co}$	$I = \frac{1}{2}$	para	B. Bleaney, D. J. E. Ingram, <u>Proc. Roy. Soc. A208</u> , 143(1951).
$^{56}_{25}\text{Mn}$	$\text{Mn}(\text{th } n, \gamma)$ $E_\gamma = 5.0, 7.2$ No line at 2.2	scin	B. Hamermesh, V. Hummel, <u>Phys. Rev.</u> 83 , 663(1951).	$^{60}_{27}\text{Co}$	$\beta_1 = 0.28\% (1.56)$ $\beta_3 < 10^{-4}\% (2.9)$		M. Deutsch, G. Scharff-Goldhaber, <u>Phys. Rev.</u> 83 , 1059(1951).
	$\text{Mn}(n, \gamma)$ $E_\gamma = 5.32, 7.16$	scin	R. W. Pringle, G. Isford, <u>Phys. Rev.</u> 83 , 467(1951).	$^{60}_{27}\text{Co}$	$\tau = 5.27 \pm 0.07^{\text{y}}$		J. Tobailen, <u>Compt. rend.</u> 233 , 1360(1951). Differential ic's
Fe	$\sigma_s(0.0017 \text{ ev}) = 1.5$ $\sigma_t(0.0017 \text{ ev}) = 1.4$		P. A. Egelstaff, <u>Nature</u> 168 , 290(1951).	$^{61}_{27}\text{Co}$	$\tau = 99.0^{\text{m}}$ $\beta^- = 45\% \quad 1.00$ $\quad 55\% \quad 1.42$ $\gamma \sim 0.5$	a	L. A. Smith et al., <u>Phys. Rev.</u> 84 , 842(1951); 83 , 886A(1951). $\text{Cu}(\gamma, \alpha)$; $\text{Ni}(\gamma, p)$; chem.
	$\sigma_t(0.003 \text{ ev}) = 7.8$ $\sigma_{\text{coh}}(0.003 \text{ ev}) = 6.0$		W. W. Havens, Jr., and L. J. Rainwater, <u>Phys. Rev.</u> 83 , 1123(1951).	Ni	$\sigma_t(14 \text{ Mev}) = 2.41$		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).
	$\sigma_t(14 \text{ Mev}) = 2.33$		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).	$^{57}_{28}\text{Ni}$	$\beta^+ = 0.835$ $\gamma = 0.123$ $\quad 1.4^* \quad 1.375$ $\quad 0.2^* \quad 1.91$	sl ce ⁻ , pe ⁻ pe ⁻	R. Canada, A. C. G. Mitchell, <u>Phys. Rev.</u> 83 , 955(1951). $\text{Fe}(\alpha, n)$; chem. *Relative to annih. γ .
$^{52}_{26}\text{Fe}$	$\beta^+ \sim 0.64$ $K/\beta^+ \sim 1.6$ $p \geq 95\% \quad 21^{\text{m}}\text{Mn}$	a No γ	G. Friedlander and J. M. Miller, <u>Phys. Rev.</u> 84 , 588(1951).	$^{85}_{28}\text{Ni}$	$\gamma\gamma(\theta)$ indicates dipole-quadrupole transitions		T. Wiedling, A. Carlsson, <u>Phys. Rev.</u> 83 , 181(1951).
$^{53}_{26}\text{Fe}$	$\beta^+ = 2.6^*$ F-K plot linear*	scin	F. I. Boley, L. J. Laslett, <u>Phys. Rev.</u> 83 , 215A(1951) and *verbal report.	Cu	$\sigma_a(\text{th } n) = 3.57$	osc	H. Pomerance, <u>Phys. Rev.</u> 83 , 641(1951).
$^{55}_{26}\text{Fe}$	$\tau = 3.0^{\text{y}}$	pc	R. P. Schuman and A. Camilli, <u>Phys. Rev.</u> 84 , 158(1951).				

Cu	$\sigma_t(14 \text{ Mev})$ 2.5		L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).	$^{75}_{33}\text{As}$	μ 1.4351 [Based on $\mu(\text{H}^1) = 2.7934$]	I	S. S. Dharmatti and H. E. Weaver, Jr., <u>Phys. Rev.</u> 84 , 367(1951).															
	$\sigma_t(14.2 \text{ Mev})$ 2.85		D. I. Meyer, W. Nyer, <u>LA-1279</u> (July 1951).																			
	$\sigma_t(156 \text{ Mev})$ 1.38		A. E. Taylor et al., <u>Phil. Mag.</u> 42 , 751(1951).	$^{76}_{33}\text{As}$	γ 100* 0.555 9.5 0.648 25 1.210 1.6 1.410 5 2.06	sl; pe ⁻ , Cpt	P. Hubert, <u>J. phys. radium</u> 12 , 823(1951). *Relative intensities of γ 's from pe ⁻ .															
$^{63}_{29}\text{Cu}$	n(θ) $\text{Cu}^{63}(\text{d},\text{n})$ I(ground) = $\frac{3}{2} + ?$		L. Schecter, <u>Phys. Rev.</u> 83 , 695(1951).	Se	$\sigma_s(0.0017 \text{ ev})$ 2 $\sigma_t(0.0017 \text{ ev})$ 4		P. A. Egelstaff, <u>Nature</u> 168 , 290(1951).															
	q -0.13 para q(Cu^{63})/q(Cu^{65}) = 1.08		B. Bleaney et al., <u>Proc. Phys. Soc. (London)</u> 64A , 758(1951).	$^{73}_{34}\text{Se}$	τ 7.08 ^h β^+ 1.1% 0.250 10.3% 0.750 87.4% 1.318 1.2% 1.680 γ 0.0671 ce ⁻ , pe ⁻ K/L = 7.6 0.361 ce ⁻ , pe ⁻ K/L = 8.6 0.860 pe ⁻ 1.310 Cpt	s π	F. R. Scott, <u>Phys. Rev.</u> 84 , 659(1951).															
$^{64}_{29}\text{Cu}$	τ 12.74 ^h pc		R. P. Schuman and A. Camilli, <u>Phys. Rev.</u> 84 , 158(1951).																			
	K Auger e ⁻ / β^+ = 1.2		E. Plassman and F. R. Scott, <u>Phys. Rev.</u> 84 , 156(1951).																			
$^{65}_{29}\text{Cu}$	q -0.12 para		B. Bleaney et al., <u>Proc. Phys. Soc. (London)</u> 64A , 758(1951).	Br	Resonances (ev) <table><tr><th>E_0</th><th>σ_0</th><th>Γ</th></tr><tr><td>35.7</td><td>9000*</td><td>0.15*</td></tr><tr><td>54</td><td>6000*</td><td>0.15*</td></tr><tr><td>104</td><td>4700**</td><td>0.24**</td></tr><tr><td>136</td><td>4800*</td><td>0.45*</td></tr></table>	E_0	σ_0	Γ	35.7	9000*	0.15*	54	6000*	0.15*	104	4700**	0.24**	136	4800*	0.45*		W. W. Havens, Jr., and L. J. Rainwater, <u>Phys. Rev.</u> 83 , 1123(1951). *Assuming $\Gamma_n \approx \Gamma_\gamma$. **Assuming $\Gamma_n \approx 3\Gamma_\gamma$.
E_0	σ_0	Γ																				
35.7	9000*	0.15*																				
54	6000*	0.15*																				
104	4700**	0.24**																				
136	4800*	0.45*																				
$^{66}_{29}\text{Cu}$	τ 5.2 ^m β^- 9% 1.59 sl 91% 2.63 γ 1.04 sl; ce ⁻ $\alpha < 3 \times 10^{-3}$ τ 5.17 $\pm$ 0.07 ^m β^- 5.5% 1.6 scin; $\beta\gamma$ 94.5% 2.7 scin γ 1.05 scin $\beta\gamma$ delay < 5×10^{-9} s τ 5.12 ^m pc		G. Friedlander and D. E. Alburger, <u>Phys. Rev.</u> 84 , 231(1951). Cu(pile n, γ). H. Roderick et al., <u>Phys. Rev.</u> 84 , 887 (1951). Cu(slow n, γ). R. P. Schuman and A. Camilli, <u>Phys. Rev.</u> 84 , 158(1951).	$^{74}_{35}\text{Br}$ $^{75}_{35}\text{Br}$ $^{76}_{35}\text{Br}$ $^{77}_{35}\text{Br}$	τ 35 ^m long-lived or stable daughter τ 95 ^m β^+ ~1.8 τ 17 ^h β^+ 2.2, 3.2 γ 0.6?, 1.4 X/ β^+ = 0.7 τ 16.5 ^h β^+ 3.5 β^+ 0.336 s π γ 0.64* 0.160 ce ⁻ , pe ⁻ 20 0.237 - ce ⁻ , pe ⁻ 0.22 0.284 pe ⁻ 0.25 0.298 pe ⁻ 100 0.520 ce ⁻ , pe ⁻ 8.6 0.641 pe ⁻ 25 0.813 pe ⁻ τ 57 ^h β^+ 0.4 s e ⁻ 0.35 s γ ~0.3, ~0.8 q(Br^{79})/q(Br^{81}) = 1.1970	a <																

³⁵ Br ⁷⁹ ₄₄	q	+0.30	I	H. G. Dehmelt, <u>Z. Physik</u> 130 , 480(1951).	⁴⁰ Zr ⁸⁹ ₄₉ 4.5 ^m	τ_1 4.4 ^m β^+ 0.36%* ~2.5 $s\pi$ γ 100%* 0.588 ce^- $\alpha_K \sim 0.06$ K/L + M ~7 $scin$	F. J. Shore et al., <u>Phys. Rev.</u> 83 , 688 (1951). *Relative intensities.	
	q	+0.31	Mic	W. Gordy, <u>J. Chem. Phys.</u> 19 , 792(1951).				
³⁵ Br ⁸¹ ₄₆	q	+0.25	I	H. G. Dehmelt, <u>Z. Physik</u> 130 , 480(1951).	⁴⁰ Zr ⁸⁹ ₄₉ 80.1 ^h	β^+ 0.890 $s\pi$ p 13 ^s Y	F. J. Shore et al., <u>Phys. Rev.</u> 83 , 688 (1951).	
	q	+0.26	Mic	W. Gordy, <u>J. Chem. Phys.</u> 19 , 792(1951).				
Rb	No measurable amount of Kr found in old Rb ores. K/ β^- <1/40,000.			E. K. Gerling and N. V. Baranovskaya, <u>Doklady Akad. Nauk S.S.S.R.</u> 76 , 825(1951), in <u>Guide to Russ. Sci. Period. Lit.</u> 4 , 203(1951).	K, β^+ to 14 ^s Y daughter K/ β^+ ~3 0.92 γ in 14 ^s Y No other γ 's $s, scin, pc$			M. Goldhaber et al., <u>Phys. Rev.</u> 83 , 661 (1951).
³⁷ Rb ⁸³ ₄₉ 19.5 ^d	I	2	M	E. H. Bellamy, <u>Nature</u> 168 , 556(1951).	⁴¹ Nb ⁹⁰ ₄₉	γ 0.14 $scin$ 1.14 2.23	G. E. Boyd, ORNL-1053 (Mar. 1951). Mo(d, α).	
	μ	(-?)1.68	M			⁴¹ Nb ⁹² ₅₁	γ weak 0.20 $scin$ 0.91 follows K	G. E. Boyd, ORNL-1053 (Mar. 1951). Mo(d, α).
³⁷ Rb ⁸⁶ ₄₉	τ	1.06 ^m		A. Flammersfeld, <u>Z. Naturforsch.</u> 6a , 559(1951). Rb (slow and fast n).	⁴¹ Nb ⁹⁴ ₅₃ 6.6 ^m	γ 0.9 $scin$	E. der Mateosian, <u>Phys. Rev.</u> 83 , 223A (1951).	
	γ	0.78						
³⁷ Rb ⁸⁷ ₅₀	K x-rays?				Mo	$\sigma_s(0.0017$ ev) <0.3 $\sigma_t(0.0017$ ev) <0.3 $\sigma_t(0.01 - 1.23$ Mev) graph $\sigma_t(14$ Mev) 3.6	P. A. Egelstaff, <u>Nature</u> 168 , 290(1951). W. F. Stubbins, <u>Phys. Rev.</u> 84 , 902(1951). L. S. Goodman, <u>ANL-4602</u> (Mar. 1951).	
	τ	$(7.6 \pm 0.4) \times 10^{10y}$		G. Charpak, F. Suzor, <u>Compt. rend.</u> 233 , 1356(1951).				
³⁷ Rb ⁸⁸ ₅₁	β^-	6.2 $\times 10^{10y}$	pc	S. C. Curran et al., <u>Phys. Rev.</u> 84 , 151(1951); <u>Phil. Mag.</u> 42 , 82(1952).	⁴² Mo ⁹¹ ₄₉	Mo(γ, n) threshold (15.5 ^m) = 13.2 threshold (75 ^s) = 13.1	R. Montalbetti L. Katz, <u>Phys. Rev.</u> 83 , 892A(1951).	
	β^-	0.275				⁴² Mo ⁹³ ₅₁ 6.75 ^h	γ 0.262 $sl; ce^-$ K/L* = 2.9 0.687 $sl; pe^-$ 0.692 ce^- 1.51 pe^-	L. Ruby, J. R. Richardson, <u>Phys. Rev.</u> 83 , 698(1951). Nb(p, n). *E5.
³⁷ Rb ⁸⁸ ₅₁	β^-	~65% 5.2	a	K. Geiger, <u>Ann. Physik</u> 9 , 293(1951).	⁴² Mo ⁹⁹ ₅₇	β^- 1.25 $s\pi$ $\gamma \sim 20^*$ 0.139 $s\pi$ ~10 0.745 pe^- ~5 0.780 Cpt ~3 0.850	N. Marty-Wollman, <u>Ann. Phys.</u> , 6 , 662(1951). *Relative intensities of photons from pe^- . See also Tc ⁹⁹ .	
	γ	~16% 3.6 ~19% 1.8 1* 3.0 10* 1.7	a $\beta\gamma$ a $\beta\gamma$ a; pe^-	No (5.2 β^- , γ). $\beta\gamma, \gamma\gamma$. *Relative intensities.		⁴² Mo ¹⁰¹ ₅₉ 14.6 ^m	γ 0.150 $scin$	E. der Mateosian, <u>Phys. Rev.</u> 83 , 223A (1951).
Sr	No X-ray resonance absorption, ~30 - 100 kev			R. H. McFarland, <u>Phys. Rev.</u> 83 , 666 (1951).	⁴³ Tc ⁹³ ₅₀	β^+ 0.800 sl γ 1.32 $scin$ (1.32 γ) β^+ coincidences	G. E. Boyd, B. H. Ketelle, <u>Phys. Rev.</u> 83 , 216A(1951).	
³⁸ Sr ⁸⁷ ₄₉ 2.75 ^h	τ	2.80 ^h		L. G. Mann and P. Axel, <u>Phys. Rev.</u> 84 , 221(1951).		⁴³ Tc ⁹⁵ ₅₂ 62 ^d	γ 0.202* $scin$ 0.578* 0.804* 1.028*	G. E. Boyd, B. H. Ketelle, <u>Phys. Rev.</u> 83 , 216A(1951) and *verbal report.
	γ	0.390 $sl; ce^-$ $\alpha_K = 0.28$ K/L + M = 6.9 e-X coincidences only		$\bar{d} 80^h Y$.	⁴³ Tc ⁹⁵ ₅₂ 20.0 ^h	γ 0.76 $scin$ 1.07 0.93 γ not found	G. E. Boyd and B. H. Ketelle, ORNL-1053 (Mar. 1951). Mo(d).	
³⁸ Y ⁸⁷ ₄₈ 80 ^h	τ	80.0 ^h		L. G. Mann and P. Axel, <u>Phys. Rev.</u> 84 , 221(1951).	⁴³ Tc ⁹⁶ ₅₆ 5.9 ^h	γ 0.139 $s\pi; ce^-$ K/L ~ 10	N. Marty-Wollman, <u>Ann. Phys.</u> , 6 , 662(1951).	
	β^+	0.3% ~0.7	sl	Sr(10 Mev d, n); chem.				
³⁸ Y ⁸⁷ ₄₈ 14 ^h	γ	0.485 $sl; ce^-$ $\alpha_K = 0.0032$						
	γX coincidences							
³⁹ Y ⁸⁷ ₄₈ 14 ^h	τ	14 ^h		L. G. Mann and P. Axel, <u>Phys. Rev.</u> 84 , 221(1951).				
	γ	0.384 $sl; ce^-$ $\alpha_K = 0.24$		Sr(10 Mev d, n); chem.				
³⁹ Y ⁸⁹ ₅₀	e-X coincidences							
	No γ 's with $E_\gamma > 1$							
³⁹ Y ⁸⁹ ₅₀	τ_1	14 ^s		M. Goldhaber et al., <u>Phys. Rev.</u> 83 , 661 (1951). Y(fast n); d 80 ^h Zr; chem.				
	γ	0.92 $scin$ $\alpha = 0.01$ M4						
³⁹ Y ⁸⁹ ₅₀	τ_1	13 ^s		F. J. Shore et al., <u>Phys. Rev.</u> 83 , 688 (1951).				
	γ	0.913 $s\pi; ce^-, scin$ d 80 ^h Zr						
Zr	σ_a (th n)	0.18	osc	H. Pomerance, <u>Phys. Rev.</u> 83 , 641(1951).				

43Tc ¹⁰¹ ₅₈	β^-	1.20	sl	G. E. Boyd, B. H. Ketelle, <u>Phys. Rev.</u> 83 , 216A(1951) and *verbal report.	50Sn ¹²³ ₇₃ 130 ^d	τ	125 ^d	J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).
	γ	st 0.300* w 0.556* w 0.734* w 0.856?*	scin			No	0.394 γ	
		(1.20 β^-)(0.30 γ)			50Sn ¹²⁷ ₇₇	τ	1.5 ^h	J. W. Barnes and A. J. Freedman, <u>Phys. Rev.</u> 84 , 365(1951).
	γ	0.260	scin	E. der Mateosian, <u>Phys. Rev.</u> 83 , 223A(1951).		p	93 ^h Sb, 9.3 ^h Te	Fission.
48Pd ¹⁰⁵ ₅₉	I	$\frac{5}{2}$	J	P. Brix, A. Steudel, <u>Naturwissenschaften</u> 38 , 431(1951).	Sb	$\sigma_t(14 \text{ Mev})$	4.6	L. S. Goodman, <u>ANL</u> -4602 (Mar. 1951).
	μ	-0.6	S		51Sb ¹²¹ ₇₀	q coupling ratio	Sb ¹²³ /Sb ¹²¹ =1.2751	I H. G. Dehmelt, H. Krüger, <u>Z. Physik</u> 130 , 385(1951).
Ag	No X-ray resonance absorption, 80 - 100 kev			R. H. McFarland, <u>Phys. Rev.</u> 83 , 666(1951).	51Sb ¹²⁴ ₇₃ 60 ^d	$\beta\gamma(\theta)$ suggests I = 1, 1, 0 or 3, 2, 0 for 2.29 β , 0.607 γ , b(E β) curves		E. K. Darby, W. Opechowski, <u>Phys. Rev.</u> 83 , 887A and 676(1951).
47Ag ¹⁰⁶ ₅₉ 24.5 ^m	τ	24.0 ^m		W. L. Bendel et al., <u>Phys. Rev.</u> 83 , 677(1951). Ag(γ ,n).	51Sb ¹²⁶ ₇₅	τ	9 ^h	J. W. Barnes and A. J. Freedman, <u>Phys. Rev.</u> 84 , 365(1951).
	β^+	29% 1.5 71% 1.94	S π			β^-	1	a
	β^- (?)	2% 0.4				γ	0.4	a, scin
	ce ⁻	weak 0.5					0.90	
	γ 's	>0.6	scin, a			$\beta\gamma\gamma$ coincidences		Fission. Assignment from yield.
Cd	σ_s/σ_a graph E _n = 0.02 - 0.4 ev $\Gamma_n/\Gamma(E_0 = 0.176) = 0.0051$			B. N. Brockhouse et al., <u>Phys. Rev.</u> 83 , 840(1951).	Te	σ_s	incoh 0.6	C. Heindl, I. W. Ruderman, <u>Phys. Rev.</u> 83 , 660(1951).
48Cd ¹¹¹ ₅₃ 48.7 ^m	γ	(0.149) $\alpha_K = 1.5$	scin E3	A. W. Sunyar, <u>Phys. Rev.</u> 83 , 864(1951).		σ_t	(0.06 - 400 ev) graph	
						E ₀ ?	0.9, 1.1, 1.2, 1.4, 1.7 ev	
49In ¹¹¹ ₆₂	(0.172 γ)(0.247 γ) ~0.1 μ s delay			M. M. Miller et al., <u>Phys. Rev.</u> 84 , 849(1951).		E ₀	2.2 ev $\sigma_0\Gamma^2 = 900$ assigned to Te ¹²³	
	μ (0.247 level)		$\gamma\gamma(\theta)$	H. Aeppli et al., <u>Phys. Rev.</u> 84 , 370(1951).	52Te ¹²¹ ₆₉ 143 ^d 17 ^d	τ	140 ^d	J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).
		-0.85				γ	0.0818	S π ;ce ⁻
49In ¹¹³ ₆₃ 1.73 ^h	γ	0.3933	S π ;ce ⁻	J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).		γ	0.2136	
						γ	0.575	S π ;ce ⁻
49In ¹¹⁴ ₆₅ 50 ^d	γ	(0.192) $\alpha_K = 2.4^*$	S, ce ⁻	R. M. Steffen, <u>Phys. Rev.</u> 83 , 166(1951). *E4.	52Te ¹²³ ₇₁	μ	-0.73209*	I S. S. Dharmatti, H. E. Weaver, Jr., <u>Phys. Rev.</u> 84 , 843(1951).
	$\gamma\gamma(\theta)$ indicates I = 4, 2, 0					$\mu(\text{Te}^{125})/\mu(\text{Te}^{123}) = 1.19$		*Based on $\mu(\text{H}^1) = 2.7934$; $\nu(\text{H}^2)/\nu(\text{H}^1) = 0.153506$; $\nu(\text{Na}^{23})/\nu(\text{H}^1) = 0.26450$.
Sn	$\sigma_t(14 \text{ Mev})$ 4.02			L. S. Goodman, <u>ANL</u> -4602 (Mar. 1951).				J. S. Ross, K. Murakawa, <u>Phys. Rev.</u> 83 , 229A(1951).
50Sn ¹¹³ ₆₃ 112 ^d	τ	118 ^d		J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).	52Te ¹²³ ₇₁ ~100 ^d	τ	121 ^d	J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).
	γ	0.2552 0.4009	S π ;ce ⁻	Sn ¹¹² (pile n).		γ	0.0887 0.1592	S π ;ce ⁻
50Sn ¹¹⁷ ₆₇ 14.5 ^d	τ	14.0 ^d		J. M. Cork et al., <u>Phys. Rev.</u> 84 , 596(1951).		γ	<0.5% (0.248)	scin
	γ	0.1559 K/L ~ 7 0.1594	S π ;ce ⁻	Sn ¹¹⁶ (pile n).				B. Hamermesh and V. Hummel, <u>Phys. Rev.</u> 84 , 381(1951).
50Sn ¹¹⁹ ₆₉ ≥ 100 ^d	γ	0.0238 $\alpha = 7$	pc	J. C. Bowe, P. Axel, <u>Phys. Rev.</u> 84 , 939(1951).	52Te ¹²⁵ ₇₃	μ	-0.88261*	I S. S. Dharmatti, H. E. Weaver, Jr., <u>Phys. Rev.</u> 84 , 843(1951).
	γ	0.02	scin	G. Scharff-Goldhaber et al., <u>Phys. Rev.</u> 83 , 480(1951).				*Based on $\mu(\text{H}^1) = 2.7934$; $\nu(\text{H}^2)/\nu(\text{H}^1) = 0.153506$; $\nu(\text{Na}^{23})/\nu(\text{H}^1) = 0.26450$.
	γ	0.0242 L/M ~ 4 0.0653 K/L = 0.51*, L/M ~ 4	S π ;ce ⁻	R. D. Hill, <u>Phys. Rev.</u> 83 , 865(1951). Sn ¹¹⁸ (n, γ). *M4.		μ	-0.7	S J. S. Ross, K. Murakawa, <u>Phys. Rev.</u> 83 , 229A(1951).

$^{52}_{58}\text{Te}^{125}_{73}$	γ	0.0353 0.1096	$s\pi;ce^-$	J. M. Cork et al., Phys. Rev. <u>84</u> , 596(1951). Te ^{124} (pile n).	γ	(0.080) sl;ce $^-$ $\tau = 5 \times 10^{-10}s$ (0.364) $\tau < 10^{-10}s$	R. L. Graham and R. E. Bell, Phys. Rev. <u>84</u> , 380(1951).
$^{52}_{90}\text{Te}^{127}_{75}$	τ	115 ^{d}		J. M. Cork et al., Phys. Rev. <u>84</u> , 596(1951). Te ^{126} (pile n).		0.080 quanta/ β^- ~2.6% ic 12 ^{d} Xe/ β^- ~0.8%	E. W. Emery, Phys. Rev. <u>83</u> , 679(1951).
$^{52}_{32}\text{Te}^{129}_{77}$	τ	33.5 ^{d}		J. M. Cork et al., Phys. Rev. <u>84</u> , 596(1951). Te ^{128} (pile n).	$^{53}_{79}\text{I}^{132}$	γ 88%* 0.68 scin 0.8? 9.5% 1.41 2.4% 2.0 (0.68 γ)(1.41 γ) No (0.68 γ)(2.0 γ)	F. C. Maienschein et al., Phys. Rev. <u>83</u> , 477(1951). *Relative intensities.
$^{53}_{69}\text{I}^{122}$	τ	3.6 ^{m}		J. N. Young et al., Phys. Rev. <u>83</u> , 1060(1951). Te ^{122} (7.4 Mev p,n).	$^{54}_{77}\text{Xe}^{131}$ ~12 ^{d}	γ 0.163 sl,ce $^-$ K/L+M = 1.67	N. F. Verster et al., Physica <u>17</u> , 637(1951).
$^{53}_{71}\text{I}^{124}$	β^+	3.1	a		$^{55}_{78}\text{Cs}^{131}$	No β^+ sl No γ sl	R. Canada, A. C. G. Mitchell, Phys. Rev. <u>83</u> , 76, 216A(1951).
$^{53}_{71}\text{I}^{124}$	No (2.2 Mev β^+) γ coincidences			D. T. Stevenson and M. Deutsch, Phys. Rev. <u>83</u> , 1202(1951).	$^{55}_{79}\text{Cs}^{134}$ 3.15 ^{h}	γ (0.128) scin $\alpha_K = 2.2$ E3	A. W. Sunyar, Phys. Rev. <u>83</u> , 864(1951). Cs(n, γ).
$^{53}_{72}\text{I}^{125}$	τ 60.0 ^{d} K 77% L 23% γ 0.035 pc <0.05% decay to ^{58}Te			G. Friedlander, W. C. Orr, Phys. Rev. <u>84</u> , 484 (1951). Conclude all decay to 0.035 level, $E_{d15} \sim 0.115$.	$^{55}_{79}\text{Cs}^{134}$ 2.3 ^{y}	β^- 25% 0.092 $s\pi$ 75% 0.648 γ 0.558 0.600 0.800 1.352	C. L. Peacock, J. L. Braud, Phys. Rev. <u>83</u> , 484A(1951). $\alpha_K = 9.1 \times 10^{-3}$ $\alpha_K = 5.7 \times 10^{-3}$ $\alpha_K = 3.0 \times 10^{-3}$
$^{53}_{73}\text{I}^{126}$	$\beta\gamma(\theta)$ curve indicates I = 2+ for 0.39 level of Xe ^{126} .			D. T. Stevenson, M. Deutsch, Phys. Rev. <u>84</u> , 1071(1951).		$\gamma\gamma(\theta)$ consistent with I = 5, 4, 2, 0	B. L. Robinson and L. Madansky, Phys. Rev. <u>84</u> , 604(1951).
$^{53}_{74}\text{I}^{127}$	q -0.65 Mic			W. Gordy, J. Chem. Phys. <u>19</u> , 792(1951).	Ba	$\sigma_t(156 \text{ Mev})$ 2.48	A. E. Taylor et al., Phil. Mag. <u>42</u> , 751(1951).
$^{53}_{75}\text{I}^{128}$	Te K X-rays K/ β^- =0.063 No X β coincidences		scin	W. B. Mims, H. Halban, Proc. Phys. Soc. (London) <u>64A</u> , 753 (1951).	$^{56}_{75}\text{Ba}^{131}$	γ 13* 0.122 sl;pe $^-$ 44 0.196 53 0.213 14 0.241 120 0.371 1000 0.497	R. Canada, A. C. G. Mitchell, Phys. Rev. <u>83</u> , 76, 216A(1951). *Relative intensities from pe $^-$'s.
$^{53}_{76}\text{I}^{129}$	q -0.47 Mic			W. Gordy, J. Chem. Phys. <u>19</u> , 792(1951).	$^{56}_{77}\text{Ba}^{133}$ 38.9 ^{h}	γ 0.275 $s\pi;ce^-$ $\alpha_K = 3$ scin	R. D. Hill, F. R. Metzger, Phys. Rev. <u>83</u> , 455(1951). Cs(10 Mev d,2n); chem.
$^{53}_{78}\text{I}^{131}$	β_1 0.250 β_2 0.335 β_3 0.606 γ_1 0.080 γ_2 9.4% 0.284 γ_3 80.0% 0.364 γ_4 7.7% 0.635 γ_5 0.6% 0.163 γ_6 2.3% 0.720 $\beta_1\gamma_6, \beta_2\gamma_4, \beta_3\gamma_2, \beta_3\gamma_3, e_1\gamma_2$ β_1^- 0.255 β_2^- 0.607 γ_4 7.8* 0.6380 γ_6 1 0.7239 (0.080 γ)(β_2^-) (0.080 γ)(β_1^-)? β^- 13.2% 0.334 86.2% 0.606 0.6% (0.807)* E γ α_K K/L 0.080 0.7 7.0 0.284 0.039 K/L+M 0.364 0.019 4.2 0.636 0.0019 0.724	sl; $\beta\gamma$ scin sl pe $^-$	B. H. Ketelle et al., Phys. Rev. <u>84</u> , 585(1951). S. Thulin, Phys. Rev. <u>83</u> , 860(1951). Te(n, γ);ms. *Relative intensities. N. F. Verster et al., Physica <u>17</u> , 637 and 658(1951). *Assumed value. See also Xe ^{131} .	$^{56}_{79}\text{Ba}^{135}$ 28.7 ^{h}	γ 0.267 scin; sl,ce $^-$ γ 0.269 $s\pi;ce^-$ $\alpha_K = 3.5$, K/L ~2	W. H. Cuffey, R. Canada, Phys. - Rev. <u>83</u> , 654(1951). R. D. Hill, F. R. Metzger, Phys. Rev. <u>83</u> , 455(1951). Ba ^{134} (pile n). J. M. Cork et al., Phys. Rev. <u>83</u> , 856 (1951). Fission. No 0.076 γ .	

NEW NUCLEAR DATA

$^{140}_{83}\text{La}$	τ	$2.0 \times 10^{11}\text{y}$		R. W. Pringle et al., Phys. Rev. <u>84</u> , 1066 (1951).					
	γ	51% 0.535 33% 0.807 15% 1.390	scin						
		<0.2 particles/sec/g with $E > 0.1$ Ba x-ray?							
	γ	0.069 0.241 0.752 0.109 0.265 0.816 0.110 0.329 0.926 0.131 0.431 1.597 0.173 0.486 1.904	s,ce ⁻	J. M. Cork et al., Phys. Rev. <u>83</u> , 856(1951). Fission.					
$^{141}_{84}\text{La}$		(2.26 β)(1.60 γ) (1.60 γ)(0.82 γ) $\gamma\gamma$ (θ) indicates I = 4+, 2+, 0+ for 2.42, 1.60, 0 levels in Ce^{140}		B. L. Robinson, L. Madansky, Phys. Rev. <u>84</u> , 1067(1951).					
	β^-	~5 0.9 ~95 2.43	sl	R. B. Duffield, L. M. Langer, Phys. Rev. <u>84</u> , 1065(1951).					
	γ	low intensity scin, $\beta\gamma$							
	$\sigma_a(\text{th n})$	0.80	osc	H. Pomerance, Phys. Rev. <u>83</u> , 641(1951).					
$^{137}_{79}\text{Ce}$	γ	0.2534	s;ce ⁻	H. B. Keller, J. M. Cork, Phys. Rev. <u>83</u> , 216A(1951); <u>84</u> , 1079 (1951).					
$^{139}_{81}\text{Ce}$	γ	0.1660 0.2752	s;ce ⁻	H. B. Keller, J. M. Cork, Phys. Rev. <u>83</u> , 216A(1951); <u>84</u> , 1079 (1951).					
$^{141}_{83}\text{Ce}$	β^-	0.42 0.57	s	E. Kondaiah, Phys. Rev. <u>83</u> , 471(1951).					
	γ	0.143	s;ce ⁻ ,pe ⁻						
	γ	0.1457	s;ce ⁻	H. B. Keller, J. M. Cork, Phys. Rev. <u>83</u> , 216A(1951); <u>84</u> , 1079 (1951).					
	γ	0.141 No γ 0.3 < E_γ < 0.6 $\beta\gamma$	scin	R. B. Duffield, L. M. Langer, Phys. Rev. <u>84</u> , 1065(1951).					
$^{143}_{85}\text{Ce}$	β^-	~30% 0.37? ~40% 1.09 ~30% 1.37	s	E. Kondaiah, Phys. Rev. <u>83</u> , 471(1951).					
	γ	~15% 0.057 ~70% 0.283 ~15% 0.649 ~15% 0.705	s; ce ⁻ , pe ⁻						
	γ	0.0575 K/L < 1 0.2906 K/L = 10 w 0.3484	s;ce ⁻ K ce ⁻	H. B. Keller, J. M. Cork, Phys. Rev. <u>83</u> , 216A(1951); <u>84</u> , 1079 (1951).					
	τ	282 ^d	pc	R. P. Schuman and A. Camilli, Phys. Rev. <u>84</u> , 158(1951).					
$^{141}_{82}\text{Pr}$	μ	value of 4.5669 due to Rb^{87} impurity		D. Williams, Phys. Rev. <u>83</u> , 858(1951).					
$^{143}_{84}\text{Pr}$	β^-	0.915	s	E. Kondaiah, Phys. Rev. <u>83</u> , 471(1951).					
$^{147}_{87}\text{Nd}$	τ	11.1 ^d							
	β_1^-	~25% 0.38							
	β_2^-	~15% 0.60	sl						
	β_3^-	~60% 0.825							
$^{147}_{86}\text{Pm}$	γ_1	0.0915							
	γ_2	K/L ~2.5	ce ⁻						
	γ_3	0.320							
	γ_3	0.534							
$^{147}_{86}\text{Pm}$	τ	2.6 ^y	pc	R. P. Schuman and A. Camilli, Phys. Rev. <u>84</u> , 158(1951).					
Sm	σ_s/σ_a	graph $E_n = 0.02 - 0.15$ ev $\Gamma_n/\Gamma(E_0 = 0.096) \sim 0.008$		B. N. Brockhouse, D. G. Hurst, Phys. Rev. <u>83</u> , 841(1951).					
$^{150}_{88}\text{Sm}$	$\text{Sm}(\text{th } n, \gamma)$	$E_\gamma = 0.341$ if K ce ⁻ was observed	s;ce ⁻	C. T. Hibdon, C. O. Muehlhause, Phys. Rev. <u>83</u> , 235A(1951)					
$^{145}_{82}\text{Eu}$	τ	5 ^d		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
$^{145}_{82}\text{Eu}$	e^-	0.2	a	Tb^{149} α decay, Sm^{147} (50 Mev p,3n); chem.					
	α	2.88	ic						
$^{146}_{83}\text{Eu}$	τ	38 ^h		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
$^{146}_{83}\text{Eu}$	e^-	0.4	a	Sm^{147} (19 Mev d,3n), Sm^{144} (25 Mev α).					
	α	2.88	ic						
$^{147}_{84}\text{Eu}$	τ	24 ^d		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
$^{147}_{84}\text{Eu}$	e^-	0.2	a	Sm^{147} (8.5 Mev p,n), chem.					
	α	2.88	ic						
$^{148}_{85}\text{Eu}$	τ	50 ^d		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
$^{148}_{85}\text{Eu}$	e^-	0.38	a	Sm^{148} (8.5 Mev p,n).					
	α	2.88	ic						
$^{149}_{86}\text{Eu}$	τ	<1 ^h or >50 ^d		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
Gd	σ_s/σ_a	indicates more than one level		B. N. Brockhouse, D. G. Hurst, Phys. Rev. <u>83</u> , 841(1951).					
Gd	$\sigma_a(\text{th n})$	35,000	osc	H. Pomerance, Phys. Rev. <u>83</u> , 641(1951).					
$^{149}_{85}\text{Gd}$	τ	9 ^d		R. W. Hoff et al., Phys. Rev. <u>83</u> , 1068(1951).					
$^{149}_{85}\text{Gd}$	α	3.0	ic	$\text{Eu}(\sim 30$ Mev p,3n), Sm^{147} (~ 30 Mev α ,2n), chem.					
	e^-	0.35	a						
$^{1587}_{94}\text{Gd}$	$\text{Gd}(\text{th } n, \gamma)$	$E_\gamma = 0.080, 0.090,$ 0.185(?)	s;ce ⁻	C. T. Hibdon, C. O. Muehlhause, Phys. Rev. <u>83</u> , 235A(1951).					
Tb	$\sigma_a(\text{th n})$	44	osc	H. Pomerance, Phys. Rev. <u>83</u> , 641(1951).					
Dy	$\sigma_a(\text{th n})$	890	osc	H. Pomerance, Phys. Rev. <u>83</u> , 641(1951).					
Ho	$\sigma_a(\text{th n})$	64	osc	H. Pomerance, Phys. Rev. <u>83</u> , 641(1951).					

$^{72}\text{Hf}_{103}^{175}$	γ	0.0891 0.113	0.228 0.342	S π ; ce $^-$ (Lu)	S. B. Burson et al., Phys. Rev. 83, 62, 222A(1951). $\text{Hf}^{174}(\text{n}, \gamma)$.	$^{76}\text{Os}_{108}^{184}$	$\sigma(\text{th n}, \gamma) 97^{\text{d}} \text{Os}$ ~ 20	M. Lindner, Phys. Rev. 84, 240(1951).	
$^{72}\text{Hf}_{107}^{179}$ 19^{s}	γ	0.161 0.217		s; ce $^-$ scin	S. B. Burson et al., Phys. Rev. 83, 62, 222A(1951). $\text{Hf}^{178}(\text{n}, \gamma)$.	$^{76}\text{Os}_{109}^{185}$	K X-rays/L X-rays = 1.5	M. M. Miller, R. G. Wilkinson, Phys. Rev. 83, 1050(1951).	
	τ	19 $^{\text{s}}$			E. der Mateosian, M. Goldhaber, Phys. Rev. 83, 843(1951). $\text{Hf}^{178}(\text{n}, \gamma)$.	$^{76}\text{Os}_{113}^{188}$	I μ	$\frac{1}{2}$ +0.6 S S	
	γ	~ 0.150 α large, M3? 0.215		scin		$^{76}\text{Os}_{117}^{193}$	$\sigma(\text{th n}, \gamma) 700^{\text{d}} \text{Os}$ 190*	M. Lindner, Phys. Rev. 84, 240(1951). [*Based on $\sigma(\text{Os}^{192}) = 1.6$.]	
	$\text{e}^- \gamma, \text{X} \gamma$ (delay	$< 0.5^{\mu\text{s}}$)				$^{76}\text{Os}_{118}^{194}$	τ p 19.0 $^{\text{h}}$ Ir	M. Lindner, Phys. Rev. 84, 240(1951). $\text{Os}(\text{th n}, \gamma)(\text{th n}, \gamma)$.	
$^{72}\text{Hf}_{108}^{180}$ 5.5 $^{\text{h}}$	τ	5.5 $^{\text{h}}$			S. B. Burson et al., Phys. Rev. 83, 62, 222A(1951). $\text{Hf}^{179}(\text{n}, \gamma)$; chem.	Ir	$\sigma_{\text{a}}(\text{th n})$	440 osc H. Pomerance, Phys. Rev. 83, 641(1951).	
	γ	0.0568 0.0932 0.214	0.330 0.442	S π ; ce $^-$ (Hf)		$^{77}\text{Ir}_{115}^{192}$ 70 $^{\text{d}}$	τ 9 γ 's assigned to β^- decay, 4 γ 's to K	J. M. Cork et al., Phys. Rev. 83, 222A (1951). $\text{Ir}(\text{n}, \gamma)$.	
$^{72}\text{Hf}_{109}^{181}$	β^-	0.420		s	S. B. Burson et al., Phys. Rev. 83, 62, 222A(1951). $\text{Hf}^{180}(\text{n}, \gamma)$.	$^{77}\text{Ir}_{117}^{194}$	γ	0.3275 s; ce $^-$	
	γ	0.133 0.136 0.344	0.481 0.611	s; ce $^-$ (Ta)			No γ	a M. Lindner, Phys. Rev. 84, 240(1951).	
		(0.420 β) e $^-$ delay;		e $^-$ e $^-$		$^{79}\text{Au}_{112}^{191}$	τ d 12.4 $^{\text{h}}$ Hg	18.0 $^{\text{h}}$ J. H. Moon, A. L. Thompson, Phys. Rev. 83, 892A(1951).	
$^{73}\text{Ta}_{107}^{180}$	τ	8.0 $^{\text{h}}$			A. J. Moses and D. S. Martin, Jr., Phys. Rev. 84, 366(1951).	$^{79}\text{Au}_{117}^{196}$ 5.55 $^{\text{d}}$	$\gamma \gamma(\theta)$ indicates I = 2, 2, 0	R. M. Steffen, D. M. Roberts, Phys. Rev. 83, 222A(1951).	
	β^-	0.7		a		$^{79}\text{Au}_{118}^{197}$	q	$\sim +0.5$ S W. von Siemens, Natur- wissenschaften 38, 455(1951).	
	$\text{W}^{182}(\leq 30 \text{ Mev } \gamma, \text{pn})$; chem.					$^{79}\text{Au}_{119}^{198}$	β^- $\gamma \sim 1\%$ $\sim 0.2\%$ (0.680 γ)(0.290 β and e $^-$ of 0.411 γ)	0.290 0.680 1.09 sl, $\beta \gamma$ scin scin A. R. Brosi et al., Phys. Rev. 84, 586(1951).	
$^{73}\text{Ta}_{109}^{182}$ 16.4 $^{\text{m}}$	γ	(0.180) $\alpha_{\text{K}} = 0.8$		scin E3	A. W. Sunyar, Phys. Rev. 83, 864(1951). $\text{Ta}(\text{n}, \gamma)$.		γ	(0.411) sl; ce $^-$ $\tau < 3 \times 10^{-\mu\text{s}}$ R. L. Graham and R. E. Bell, Phys. Rev. 84, 380(1951).	
$^{73}\text{Ta}_{110}^{183\text{f}}$	τ	6.0 $^{\text{d}}$			A. J. Moses and D. S. Martin, Jr., Phys. Rev. 84, 366(1951).		$\sigma(\text{th n}, \gamma) 3.3^{\text{d}} \text{Au}$ $= 3.8 \times 10^4$	P. M. Sherk and R. D. Hill, Phys. Rev. 83, 1097(1951).	
	β^-	0.6		a		$^{79}\text{Au}_{120}^{199}$	β_1^- 22.5% 0.250 β_2^- 73.5% 0.300 β_3^- 4% 0.460	S π P. M. Sherk and R. D. Hill, Phys. Rev. 83, 1097(1951).	
$^{73}\text{Ta}_{112}^{185}$	τ	48 $^{\text{m}}$			A. J. Moses and D. S. Martin, Jr., Phys. Rev. 84, 366(1951). $\text{W}(\leq 30 \text{ Mev } \gamma)$; chem.		γ	3.5% 0.050 77% 0.159 19% 0.209 S π ; ce $^-$, sl; pe $^-$	
	$\beta^-, \text{e}^-?$	0.15		a			γ	(0.158) $\tau = 2.4 \times 10^{-9\text{s}}$ (0.207) $\tau < 2 \times 10^{-10\text{s}}$ R. L. Graham and R. E. Bell, Phys. Rev. 84, 380(1951).	
	β^-	1.6		a			τ	12.4 $^{\text{h}}$	J. H. Moon, A. L. Thompson, Phys. Rev. 83, 892A(1951). $\text{Au}(60 \text{ Mev p})$; chem.
	No $\beta\beta$ for delay	$< 10^{\mu\text{s}}$					Soft, converted γ 's Mass from daughters		
	$\sigma_{\text{t}}(14 \text{ Mev})$	4.62			L. S. Goodman, ANL- 4602 (Mar. 1951).				
	Isotope shifts				J. A. Vreeland, K. Murakawa, Phys. Rev. 83, 229A(1951).				
	$\Delta(\text{W}^{186} - \text{W}^{184}) : \Delta(\text{W}^{184} - \text{W}^{182}) : \Delta(\text{W}^{182} - \text{W}^{180}) = 1 :$								
	1.13: 1.02								
$^{74}\text{W}_{106}^{180}$	$\sigma(\text{th n}, \gamma) 140^{\text{d}} \text{W}$	≈ 2			M. Lindner, Phys. Rev. 84, 240(1951).				
$^{74}\text{W}_{107}^{181}$	τ	$\sim 120^{\text{d}}$			M. Lindner, Phys. Rev. 84, 240(1951). $\text{W}(\text{n}, \gamma)$.				
	X-rays, hard γ 's								
$^{74}\text{W}_{109}^{183}$	μ	+0.08		S	J. A. Vreeland, K. Murakawa, Phys. Rev. 83, 229A(1951).				
$^{74}\text{W}_{113}^{187}$	$\sigma(\text{th n}, \gamma) 65^{\text{d}} \text{W}$	80			M. Lindner, Phys. Rev. 84, 240(1951).				
Re	Resonances*				S. P. Harris, Phys. Rev. 83, 235A(1951) and *verbal report.				
	E_0	2.1, 5.7, 7.1, 10.9(Re ^{187}), 18							
$^{75}\text{Re}_{114}^{189\text{f}}$	$\tau(\sim 0.2\beta^-)$	$\sim 150^{\text{d}}$			M. Lindner, Phys. Rev. 84, 240(1951). $\text{Re}(\text{th n}, \gamma)$; chem.				
	$\tau(\sim 0.75\beta^-)$	$> 5^{\text{y}}$							

$^{80}\text{Hg}_{112}^{192}$	τ	8.4 ^h		J. H. Moon, A. L. Thompson, Phys. Rev. <u>83</u> , 892A(1951). Au(55 Mev p); chem.	$^{82}\text{Pb}_{132}^{214}$	γ	0.0529 0.2415	0.2946 0.3509	$s\pi$; ce ⁻	J. M. Cork et al., Phys. Rev. <u>83</u> , 681 (1951).		
	K						E_{γ}	K^*	L_1^*	M_1^*	N_1^*	S. Kageyama, J. Phys. Soc. (Japan) <u>6</u> , 285 (1951). *Intensities of ce ⁻ lines relative to I(K line of 0.606 γ of RaC) = 40.
$^{80}\text{Hg}_{113}^{193}$	τ_1	14.5 ^h		J. H. Moon, A. L. Thompson, Phys. Rev. <u>83</u> , 892A(1951). Au(45 Mev p); chem.			0.240	415	60	17	$s\pi$	
	τ_2	29.0 ^h					0.294	480	75	20		
	K						0.350	540	95	30	5	
$^{80}\text{Hg}_{115}^{195}$	τ	38 ^h		J. H. Moon, A. L. Thompson, Phys. Rev. <u>83</u> , 892A(1951). Au(25 Mev p); chem.	Bi	$\sigma_t(14 \text{ Mev})$						L. S. Goodman, ANL-4602 (Mar. 1951).
	K							5.13				
$^{80}\text{Hg}_{119}^{199}$	μ	0.56	S	E. W. Foster, Proc. Roy. Soc. (London) <u>208A</u> , 367(1951).	$^{83}\text{Bi}_{124}^{207}$	γ	~100% ~100%	0.56 1.1	scin			M. A. Grace, J. R. Prescott, Phys. Rev. <u>84</u> , 1059(1951).
							$\gamma\gamma$, Pb K x-ray					
$^{80}\text{Hg}_{123}^{203}$	β^-	0.210	pc	H. W. Wilson, S. C. Curran, Phil. Mag. <u>42</u> , 762(1951).	$^{83}\text{Bi}_{127}^{210}$	Continuous γ spectrum						L. Madansky, F. Rasetti, Phys. Rev. <u>83</u> , 187(1951).
	γ	0.278	$s\pi, pe^-$		4.85 ^d	$\gamma(E_{\gamma} > 0.09)/\beta^- = 0.0016$						
	$\alpha_K = 0.25$		K/L = 3.7									
$^{81}\text{Tl}_{118}^{199}$	γ 's (kev)		$s\pi, ce^-$	H. I. Isreal, R. G. Wilkinson, Phys. Rev. <u>83</u> , 1051(1951). Au($\alpha, 2n$), chem. No β^+ .	$^{83}\text{Bi}_{129}^{212}$	α to 0.608 level						A. Rytz, Compt. rend. <u>233</u> , 790(1951).
	47	157	332			0.016% of α 's						
	78	206	454									
	103	245	490									
$^{81}\text{Tl}_{119}^{200}$	γ 's (kev)		$s\pi, ce^-$	H. I. Isreal, R. G. Wilkinson, Phys. Rev. <u>83</u> , 1051(1951). Au(α, n), chem. No β^+ .	$^{83}\text{Bi}_{131}^{214}$	γ	0.0625 0.1911 0.609 0.769 0.935	1.122 1.241 1.419 1.766	$s\pi$; ce ⁻			J. M. Cork et al., Phys. Rev. <u>83</u> , 681 (1951). *Converted in Tl. **Converted in Po.
	365	622	1,210									
	577	829	1,360									
$^{81}\text{Tl}_{127}^{208}$	γ	2.6147 $\pm$ 0.0006		W. L. Brown, Phys. Rev. <u>83</u> , 271(1951).	$^{84}\text{Po}_{116}^{200}$	τ		11 ^m				D. G. Karraker et al., Phys. Rev. <u>83</u> , 390 (1951). Bi(100 Mev p); chem. p 27 ^h Tl.
	$H_p = 9988 \pm 2$ gauss cm (based on p resonance)					K predominant						
	$H_p(L) = 2607.17 \pm 0.30$			G. Lindström, Arkiv Fysik <u>4</u> , 1(1951).	$^{84}\text{Po}_{117}^{201}$	τ		18 ^m				D. G. Karraker et al., Phys. Rev. <u>83</u> , 390(1951). Bi(100 Mev p); chem. p 72 ^h Tl.
	γ_L	510.85 $\pm$ 0.08	kev			K predominant						
						α	5.70		ic			
Pb	$\sigma_t(14 \text{ Mev})$			L. S. Goodman, ANL-4602 (Mar. 1951).	$^{84}\text{Po}_{122}^{206}$	α	5.21		ic			D. G. Karraker et al., Phys. Rev. <u>83</u> , 390 (1951).
	5.0											
	$\sigma_t(156 \text{ Mev})$			A. E. Taylor et al., Phil. Mag. <u>42</u> , 751(1951).	$^{84}\text{Po}_{123}^{207}$	α	5.10		ic			D. G. Karraker et al., Phys. Rev. <u>83</u> , 390 (1951).
	3.50											
$^{82}\text{Pb}_{125}^{207}$	τ	0.82 ^s		J. Lascoux and G. Vendryes, Compt. rend. <u>233</u> , 858, (1951).	$^{84}\text{Po}_{124}^{208}$	α	5.10		ic			D. G. Karraker et al., Phys. Rev. <u>83</u> , 390 (1951).
$^{82}\text{Pb}_{128}^{210}$	γ	0.0467	sl	D. K. Butt, W. D. Brodie, Proc. Phys. Soc. (London) <u>64A</u> , 791(1951).	$^{84}\text{Po}_{125}^{209}$	α	4.86		ic			D. G. Karraker et al., Phys. Rev. <u>83</u> , 390 (1951).
	$\alpha_L = 13.5$											
	Bi Auger lines											
	γ 100%	0.0464	$s\pi; ce^-$	J. M. Cork et al., Phys. Rev. <u>83</u> , 681 (1951).	$^{84}\text{Po}_{126}^{210}$	γ	0.784		$s\pi; ce^-$			J. M. Cork et al., Phys. Rev. <u>83</u> , 681 (1951).
	ce ⁻ 's of other γ 's	<1%				α	5.298		EA			W. J. Sturm, V. Johnson, Phys. Rev. <u>83</u> , 542(1951).
						Based on Li(p,n) threshold = 1.882						
	Coincidences stopped by			P. Falk-Vairant et al., Compt. rend. <u>233</u> , 1025(1951).	$^{84}\text{Po}_{130}^{214?}$	γ	0.4575		$s\pi; ce^-$			J. M. Cork et al., Phys. Rev. <u>83</u> , 681 (1951). In Ra ²²⁶ , not Pb ²¹⁰ source.
	~0.3 mg/cm ² (both G-M's)											
	~1.8 mg/cm ² (one G-M)											
	Conclude $E_{\beta} < 8$ kev											
$^{82}\text{Pb}_{130}^{212}$	$H_p(I) = 1754.01 \pm 0.20$			G. Lindström, Arkiv Fysik <u>4</u> , 1(1951).	$^{84}\text{Po}_{130}^{214}$	α	7.683		EA			W. J. Sturm, V. Johnson, Phys. Rev. <u>83</u> , 542(1951).
	$H_p(F) = 1388.56 \pm 0.15$					Based on Li(p,n) threshold = 1.882						
	γ_1	238.63 $\pm$ 0.04	kev									

$^{86}\text{Rn}_{136}^{222}$	τ	3.825 ± 0.0005^d		J. Tobailen, <u>Compt. rend. 233, 1360(1951).</u> Differential ic's.	$^{98}\text{Cf}_{148}^{246}$	τ	35.7^h		E. K. Hulet et al., <u>Phys. Rev. 84, 366(1951).</u> p Cm ²⁴² .
$^{88}\text{Ra}_{138}^{226}$	γ	0.1856	$s\pi; ce^-$	J. M. Cork et al., <u>Phys. Rev. 83, 681 (1951).</u>		α	6.75	ic	
	α	$\sim 93.3\%$ (4.8) $\sim 6.5\%$ (4.6) $\sim 0.2\%$ 4.21		G. Bastin-Scoffier, <u>Compt. rend. 233, 945(1951).</u>	Q's Between Ground States				
$^{89}\text{Ac}_{138}^{227}$	I	$\frac{3}{2}$	S	F. S. Tompkins et al., <u>Phys. Rev. 84, 168(1951).</u>	T(d, α)n		17.578 ± 0.030		R. M. Williamson et al., <u>Phys. Rev. 84, 731(1951).</u>
$^{90}\text{Th}_{138}^{228}$	$\alpha\gamma(\theta)$ indicates $0 \leq 2 \leq 0$ predominant			J. K. Beling et al., <u>Phys. Rev. 84, 155(1951).</u>	Li ⁶ (p, α)He ³		4.024 ± 0.005		
$^{91}\text{Pa}_{143}^{2347}$	Possible n emitter			M. da Silveira, <u>Portugaliae Phys. 1, 167(1945).</u>	H ³ (p, n)He ³		-0.7647		T. W. Bonner and J. W. Butler, <u>Phys. Rev. 83, 1091(1951).</u>
$^{91}\text{Pa}_{143}^{234}$	n radiation assigned to UX ₂ * probably is from spontaneous fission of U ²³⁵ .			M. E. Nahmias, <u>Compt. rend. 233, 1185(1951).</u> *M. da Silveira, <u>Portugaliae Phys. 1, 167(1945).</u>	H ³ (p, γ)He ⁴		19.7 ± 0.3 s, pe ⁻		R. S. Rochlin, <u>Phys. Rev. 84, 165(1951).</u>
$^{93}\text{Np}_{146}^{239}$	β_1^- 0.31 β_2^- 0.44 γ_0^- 0.049 γ_1 0.057 γ_2 0.061 γ_3 0.067	β_3^- 0.70 γ_6 0.210 γ_7 0.227 γ_8 0.276	sl sl; ce ⁻	R. L. Graham, R. E. Bell, <u>Phys. Rev. 83, 222A(1951).</u> $\gamma_3\gamma_6$. No $\gamma_7\gamma_8$. No $\beta_3\gamma$. $1.1 \times 10^{-3\mu s}$ delay between β_2 and γ_6 , γ_7 , and γ_8 .	Be ⁸ -2He ⁴		0.0775 ± 0.004		R. R. Carlson, <u>Phys. Rev. 84, 749(1951).</u>
	β^- 0.34 0.44 0.0442 0.0490 0.0570 0.0614 0.0675 0.286	0.65 0.72 0.209 0.228 0.254 0.277	$s\pi \sqrt{2}$ $s\pi \sqrt{2};$ ce ⁻	E. P. Tomlinson et al., <u>Phys. Rev. 83, 223A(1951).</u>	Li ⁶ (γ , n)Li ⁵		-5.35 ± 0.20		R. Sher et al., <u>Phys. Rev. 84, 387 (1951).</u> *
$^{94}\text{Pu}_{146}^{240}$	τ	6580 ^y		M. G. Inghram et al., <u>Phys. Rev. 83, 1250(1951).</u>	Be ⁹ (p, α)Li ⁶		2.130 ± 0.010		R. R. Carlson, <u>Phys. Rev. 84, 749 (1951).</u> *
	τ	6240 ^y		E. F. Westrum Jr., <u>Phys. Rev. 83, 1249(1951).</u>	Be ⁹ (p, α)Li ⁶		2.123 ± 0.004		C. P. Browne et al., <u>Phys. Rev. 83, 179(1951).</u>
$^{94}\text{Pu}_{148}^{242}$	$\sigma(\text{th } n, \gamma)^{5h}\text{Pu}$	~ 100		J. C. Sullivan et al., <u>Phys. Rev. 83, 1267(1951).</u>	Be ⁹ (p, α)Li ⁶		2.123 ± 0.004		R. M. Williamson et al., <u>Phys. Rev. 84, 731(1951).</u>
$^{94}\text{Pu}_{149}^{243}$	τ	5 ^h		J. C. Sullivan et al., <u>Phys. Rev. 83, 1267(1951).</u>	Be ⁹ (d, α)Li ⁷		7.159 ± 0.009		
	β^-	~ 0.5	a		Li ⁷ (d, p)Li ⁸		-0.192 ± 0.001		
	τ	5.0 ^h		S. G. Thompson et al., <u>Phys. Rev. 84, 164(1951).</u>	Be ⁹ (p, d)Be ⁸		0.558 ± 0.002		
	β^-	0.39	s, a	Pu ²⁴² (n, γ).	Be ⁹ (d, t)Be ⁸		4.67 ± 0.03 ppl		F. A. El-Bedewi, <u>Proc. Phys. Soc. (London) 64A, 947(1951).</u>
	γ	0.095	s, a		Be ⁹ (p, d)Be ⁸		0.558 ± 0.005		R. R. Carlson, <u>Phys. Rev. 84, 749(1951).</u>
		0.12	s, a		Be ⁹ (d, p)Be ¹⁰		4.55 ± 0.03 ppl		A. J. Salmon, <u>Proc. Phys. Soc. (London) 64A, 848(1951).</u>
$^{97}\text{Bk}_{148}^{245}$	τ	4.95 ^d		E. K. Hulet et al., <u>Phys. Rev. 84, 366(1951).</u> Produced by Cm ^{242, 243, 244} (d), chem; not by Am ²⁴¹ (α).	B ¹⁰ (γ , n)B ⁹		-8.55 ± 0.25		R. Sher, et al., <u>Phys. Rev. 84, 387 (1951).</u> *
	α	34% 5.90 48% 6.15 18% 6.33	ic		B ¹¹ (γ , n)B ¹⁰		-11.50 ± 0.25		
	$\alpha/K \sim 0.1\%$				O ¹⁸ (d, α)N ¹⁴		3.09 ± 0.02		H. B. Burrows et al., <u>Proc. Roy. Soc. (London) 209A, 478(1951).</u>
					O ¹⁸ (d, p)O ¹⁷		1.93 ± 0.01		
					F ¹⁹ (d, α)O ¹⁷		10.04 ± 0.02		
					O ¹⁸ (d, n)F ¹⁷		-1.631		T. W. Bonner and J. W. Butler, <u>Phys. Rev. 83, 1091(1951).</u>

NEW NUCLEAR DATA

$\text{Ne}^{20}(\text{d},\alpha)\text{F}^{18}$	2.78 ± 0.02 ppl	R. Middleton, C. T. Tai, <u>Proc. Phys. Soc.</u> <u>(London) 64A,</u> 801(1951).	$\text{P}^{31}(\gamma,\text{n})\text{P}^{30}$	-12.05 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*
$\text{O}^{16}(\alpha,\text{p})\text{F}^{19}$	-8.08 ± 0.1	M. L. Bullock, M. B. Sampson, <u>Phys. Rev. 84,</u> 967(1951).	$\text{S}^{34}(\gamma,\text{n})\text{S}^{33}$	-10.85 ± 0.20	
$\text{F}^{19}(\text{d},\text{p})\text{F}^{20}$	4.39 ± 0.03	H. B. Burrows et al., <u>Proc.</u> <u>Roy. Soc. (London) 209A,</u> 478(1951).	$\left. \begin{array}{l} \text{Cl}^{35}(\gamma,\text{n})\text{Cl}^{34} \\ \text{Cl}^{37}(\gamma,\text{n})\text{Cl}^{36} \end{array} \right\}$	-9.95 ± 0.20	
$\text{F}^{19}(\text{n},\gamma)\text{F}^{20}$	6.63 ± 0.03	B. B. Kinsey et al., <u>Phys.</u> <u>Rev. 83,</u> 519(1951).	$\text{A}^{40}(\gamma,\text{p})\text{Cl}^{39}$	-10.8 ± 0.1	D. H. Wilkinson, J. H. Carver, <u>Phys. Rev. 83,</u> 466(1951).
$\text{Ne}^{22}(\text{d},\alpha)\text{F}^{20}$	2.62 ± 0.10 ppl	R. Middleton, C. T. Tai, <u>Proc. Phys. Soc.</u> <u>(London) 64A,</u> 801(1951).	$\text{V}^{51}(\gamma,\text{n})\text{V}^{50}$	-11.15 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*
$\text{Ne}^{20}(\text{d},\text{p})\text{Ne}^{21}$	4.54 ± 0.04 ppl	R. Middleton, C. T. Tai, <u>Proc. Phys. Soc.</u> <u>(London) 64A,</u> 801(1951).	$\text{Cr}^{52}(\gamma,\text{n})\text{Cr}^{51}$	-11.80 ± 0.25	
$\text{Na}^{23}(\gamma,\text{n})\text{Na}^{22}$	-12.05 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*	$\text{Cr}^{53}(\gamma,\text{n})\text{Cr}^{52}$	-7.75 ± 0.20	
$\text{Mg}^{24}(\gamma,\text{n})\text{Mg}^{23}$	-16.55 ± 0.25		$\text{Mn}^{55}(\gamma,\text{n})\text{Mn}^{54}$	-10.00 ± 0.20	
$\text{Mg}^{25}(\gamma,\text{n})\text{Mg}^{24}$	-7.25 ± 0.20		$\text{Mn}^{55}(\text{n},\gamma)\text{Mn}^{56}$	7.2	B. Hamermesh, V. Hum- mel, <u>Phys. Rev. 83,</u> 663 (1951).
$\text{Al}^{27}(\text{d},\alpha)\text{Mg}^{25}$	6.694 ± 0.010	H. Enge et al., <u>Phys.</u> <u>Rev. 83,</u> 31(1951).	$\text{Mn}^{55}(\text{n},\gamma)\text{Mn}^{56}$	7.16 ± 0.05	R. W. Pringle, G. Isford, <u>Phys. Rev. 83,</u> 467(1951).
$\text{Mg}^{26}(\gamma,\text{n})\text{Mg}^{25}$	-11.15 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*	$\text{Fe}^{56}(\gamma,\text{n})\text{Fe}^{55}$	-11.15 ± 0.25	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*
$\text{Al}^{27}(\gamma,\text{n})\text{Al}^{26}$	-12.75 ± 0.20		$\text{Fe}^{57}(\gamma,\text{n})\text{Fe}^{56}$	-7.75 ± 0.20	
$\text{Al}^{27}(\text{n},\gamma)\text{Al}^{28}$	7.6	B. Hamermesh, V. Hum- mel, <u>Phys. Rev. 83,</u> 663 (1951).	$\text{Fe}^{56}(\text{n},\gamma)\text{Fe}^{57}$	7.4	B. Hamermesh, V. Hum- mel, <u>Phys. Rev. 83,</u> 663 (1951).
$\text{Al}^{27}(\text{n},\gamma)\text{Al}^{28}$	7.72 ± 0.01	B. B. Kinsey et al., <u>Phys.</u> <u>Rev. 83,</u> 519(1951).	$\text{Co}^{59}(\gamma,\text{n})\text{Co}^{58}$	-10.25 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*
$\text{Al}^{27}(\text{d},\text{p})\text{Al}^{28}$	5.53	K. K. Keller, <u>Phys. Rev. 84,</u> 884(1951).	$\text{Co}^{59}(\text{p},\text{n})\text{Ni}^{59}$	1.857 ± 0.003	J. J. McCue and W. M. Preston, <u>Phys. Rev. 84,</u> 384(1951).
$\text{Al}^{27}(\text{d},\text{p})\text{Al}^{28}$	5.494 ± 0.010	H. Enge et al., <u>Phys.</u> <u>Rev. 83,</u> 31(1951).	$\text{Cu}^{63}(\gamma,\text{n})\text{Cu}^{62}$	-10.85 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*
$\text{Si}^{29}(\gamma,\text{n})\text{Si}^{28}$	-8.45 ± 0.20	R. Sher et al., <u>Phys. Rev. 84,</u> 387 (1951).*	$\text{Cu}^{65}(\gamma,\text{n})\text{Cu}^{64}$	-9.75 ± 0.20	
$\text{Si}^{28}(\text{n},\gamma)\text{Si}^{29}$	8.51 ± 0.04	B. B. Kinsey et al., <u>Phys.</u> <u>Rev. 83,</u> 519(1951).	$\text{Zn}^{64}(\gamma,\text{n})\text{Zn}^{63}$	-11.65 ± 0.20	
$\text{Si}^{28}(\text{d},\text{p})\text{Si}^{29}$	6.246 ± 0.010	P. M. Endt et al., <u>Phys.</u> <u>Rev. 83,</u> 491(1951).	$\text{Zn}^{66}(\gamma,\text{n})\text{Zn}^{65}$	-11.15 ± 0.20	
$\text{Si}^{29}(\text{n},\gamma)\text{Si}^{30}$	10.55 ± 0.05	B. B. Kinsey et al., <u>Phys.</u> <u>Rev. 83,</u> 519(1951).	$\text{Zn}^{67}(\gamma,\text{n})\text{Zn}^{66}$	-7.00 ± 0.20	
$\text{P}^{31}(\text{d},\alpha)\text{Si}^{29}$	8.17 ± 0.02	P. M. Endt et al., <u>Phys.</u> <u>Rev. 83,</u> 491(1951).	$\text{Zn}^{68}(\gamma,\text{n})\text{Zn}^{67}$	-10.15 ± 0.20	
			$\text{Ga}^{69}(\gamma,\text{n})\text{Ga}^{68}$	-10.10 ± 0.20	
			$\text{Ga}^{71}(\gamma,\text{n})\text{Ga}^{70}$	-9.05 ± 0.20	
			$\text{As}^{75}(\gamma,\text{n})\text{As}^{74}$	-10.10 ± 0.20	
			$\text{Se}^?(\gamma,\text{n})\text{Se}^?$	-7.30 ± 0.20	
			$\text{Se}^?(\gamma,\text{n})\text{Se}^?$	-9.35 ± 0.20	
			$\text{Br}^{79}(\gamma,\text{n})\text{Br}^{78}$	-10.60 ± 0.20	
			$\text{Br}^{81}(\gamma,\text{n})\text{Br}^{80}$	-9.95 ± 0.20	

$\text{Sr}^{86}(\gamma, n)\text{Sr}^{85}$	-9.50 ± 0.20	R. Sher et al., <u>Phys. Rev. 84</u> , 387 (1951).*	$\text{Pt}^{196}(\gamma, n)\text{Pt}^{195}$	-8.20 ± 0.20	R. Sher et al., <u>Phys. Rev. 84</u> , 387 (1951).*
$\text{Sr}^{87}(\gamma, n)\text{Sr}^{86}$	-8.40 ± 0.20		$\text{Au}^{197}(\gamma, n)\text{Au}^{196}$	-7.90 ± 0.20	
$\text{Sr}^{88}(\gamma, n)\text{Sr}^{87}$	-11.15 ± 0.20		$\text{Tl}^{203}(\gamma, n)\text{Tl}^{202}$	-8.80 ± 0.20	
$\text{Nb}^{93}(\gamma, n)\text{Nb}^{92}$	-8.70 ± 0.20		$\text{Tl}^{205}(\gamma, n)\text{Tl}^{204}$	-7.55 ± 0.20	
$\text{Mo}^?(\gamma, n)\text{Mo}^?$	-6.75 ± 0.25		$\text{Pb}^{207}(\gamma, n)\text{Pb}^{206}$	-6.75 ± 0.20	
$\text{Mo}^?(\gamma, n)\text{Mo}^?$	-7.95 ± 0.25		$\text{Pb}^{208}(\gamma, n)\text{Pb}^{207}$	-7.30 ± 0.20	
$\text{Ru}^?(\gamma, n)\text{Ru}^?$	-7.05 ± 0.20		$\text{Bi}^{209}(\gamma, n)\text{Bi}^{208}$	-7.40 ± 0.20	
$\text{Ru}^?(\gamma, n)\text{Ru}^?$	-9.50 ± 0.20		$\text{Th}^{232}(\gamma, n)\text{Th}^{231}$	-6.35 ± 0.04	L. B. Magnusson et al., <u>Phys. Rev. 84</u> , 166(1951).
$\text{Rh}^{103}(\gamma, n)\text{Rh}^{102}$	-9.35 ± 0.20				
$\text{Pd}^?(\gamma, n)\text{Pd}^?$	-7.05 ± 0.20				
$\text{Pd}^?(\gamma, n)\text{Pd}^?$	-9.35 ± 0.20				
$\text{Ag}^{109}(\gamma, n)\text{Ag}^{108}$	-9.05 ± 0.20				
$\text{Cd}^{113}(\gamma, n)\text{Cd}^{112}$	-6.55 ± 0.20				
$\text{In}^{115}(\gamma, n)\text{In}^{114}$	-9.05 ± 0.20				
$\text{Sn}^{118}(\gamma, n)\text{Sn}^{117}$	-9.10 ± 0.20				
$\text{Sn}^{119}(\gamma, n)\text{Sn}^{118}$	-6.60 ± 0.20				
$\text{Sb}^{121}(\gamma, n)\text{Sb}^{120}$	-8.95 ± 0.25				
$\text{Sb}^{123}(\gamma, n)\text{Sb}^{122}$					
$\text{Te}^?(\gamma, n)\text{Te}^?$	-6.50 ± 0.20				
$\text{Te}^?(\gamma, n)\text{Te}^?$	-8.55 ± 0.20				
$\text{I}^{127}(\gamma, n)\text{I}^{126}$	-9.10 ± 0.20				
$\text{Cs}^{133}(\gamma, n)\text{Cs}^{132}$	-9.05 ± 0.20				
$\text{Ba}^?(\gamma, n)\text{Ba}^?$	-6.80 ± 0.20				
$\text{Ba}^?(\gamma, n)\text{Ba}^?$	-8.55 ± 0.25				
$\text{La}^{139}(\gamma, n)\text{La}^{138}$	-8.80 ± 0.20				
$\text{Ce}^{140}(\gamma, n)\text{Ce}^{139}$	-9.05 ± 0.20				
$\text{Ce}^{142}(\gamma, n)\text{Ce}^{141}$	-7.15 ± 0.20				
$\text{Ta}^{181}(\gamma, n)\text{Ta}^{180}$	-7.55 ± 0.20				
$\text{W}^?(\gamma, n)\text{W}^?$	-6.25 ± 0.30				
$\text{W}^?(\gamma, n)\text{W}^?$	-7.15 ± 0.30				
$\text{Re}^{187}(\gamma, n)\text{Re}^{186}$	-7.30 ± 0.30				
$\text{Ir}^{193}(\gamma, n)\text{Ir}^{192}$	-7.80 ± 0.20				
$\text{Pt}^{194}(\gamma, n)\text{Pt}^{193}$	-9.50 ± 0.20				
$\text{Pt}^{198}(\gamma, n)\text{Pt}^{194}$	-6.10 ± 0.20				

* Detected n's in BF₃ counters.Packing Fraction Differences, Δf , in Units 10^{-4} amu

Entries under both members of doublets except for those involving hydrocarbons

Doublet	Δf	Reference
$\text{CH}_4 - \text{O}$	22.777 ± 0.003	K. Ogata, H. Matsuda, <u>Phys. Rev. 83</u> , 180(1951).
$\text{C}_2\text{H}_4 - \text{CO}$	13.018 ± 0.002	
$\text{N}^{14} - \text{CH}_2$	-8.996 ± 0.001	
$\text{N}_2^{14} - \text{C}_2\text{H}_4$	-9.000 ± 0.002	
$\text{N}^{15} - \text{CH}_3$	-15.597 ± 0.003	
$\text{S}^{32} - \text{O}_2$	-5.550 ± 0.002	T. L. Collins et al., <u>Phys. Rev. 84</u> , 717(1951).
$\text{S}^{32}\text{O} - \text{C}_4$	-6.902 ± 0.003	
$\text{CO}_2 - \text{C}_3\text{H}_8$	-16.558 ± 0.004	
$\text{S}^{32} - \text{Ni}^{64}$	$+2.65 \pm 0.02$	H. E. Duckworth et al., <u>Phys. Rev. 83</u> , 1114(1951).
$\text{S}^{33}\text{O} - \text{C}_4\text{H}$	-8.446 ± 0.009	T. L. Collins et al., <u>Phys. Rev. 84</u> , 717(1951).
$\text{S}^{34}\text{O} - \text{C}_4\text{H}_2$	-10.580 ± 0.008	
$\text{HCl}^{35} - \text{C}_3$	-6.484 ± 0.012	
$\text{HCl}^{37} - \text{C}_3\text{H}_2$	-11.056 ± 0.012	
$\text{A}^{36} - \text{C}_3$	-9.028 ± 0.009	
$\text{A}^{36} - \text{H}_2\text{O}$	-14.899 ± 0.015	
$\text{A}^{38} - \text{C}_3\text{H}_2$	-13.924 ± 0.010	
$\text{K}^{39} - \text{C}_3\text{H}_3$	-15.360 ± 0.007	
$\text{K}^{41} - \text{C}_3\text{H}_5$	-18.869 ± 0.008	
$\text{Ca}^{42} - \text{C}_3\text{H}_6$	-21.011 ± 0.008	
$\text{Ca}^{43} - \text{C}_3\text{H}_7$	-22.335 ± 0.012	H. E. Duckworth et al., <u>Phys. Rev. 83</u> , 1114(1951).
$\text{Ca}^{44} - \text{CO}_2$	-7.865 ± 0.013	
$\text{Ca}^{48} - \text{C}_4$	-9.915 ± 0.021	
$\text{Sc}^{45}\text{O} - \text{C}_2\text{O}_2\text{H}_5$	-12.839 ± 0.007	
$\text{Ti}^{47} - \text{Pr}^{141}$	-3.64 ± 0.03	
$\text{Fe}^{58} - \text{Th}^{232}$	-13.17 ± 0.06	
$\text{Ni}^{60} - \text{Hf}^{180}$	-8.57 ± 0.03	
$\text{Ni}^{64} - \text{O}^{16}$	-8.25 ± 0.03	
$\text{Ni}^{64} - \text{S}^{32}$	-2.65 ± 0.02	
$\text{Cu}^{63} - \text{Te}^{128}$	-3.61 ± 0.07	
$\text{Cu}^{65} - \text{Te}^{130}$	-3.98 ± 0.06	G. S. Stanford, H. E. Duckworth, <u>Phys. Rev. 83</u> , 229 (A)(1951).
$\text{Zn}^{64} - \text{Te}^{128}$	-3.91 ± 0.07	
$\text{Ge}^{70} - \text{Ce}^{140}$	-4.25 ± 0.03	
$\text{Ge}^{72} - \text{Nd}^{144}$	-4.85 ± 0.07	
$\text{Ge}^{73} - \text{Nd}^{146}$	-4.64 ± 0.08	

NEW NUCLEAR DATA

Doublet	Δf	Reference	Doublet	Δf	Reference
Kr ⁸² - C ₃ H ₅	-20.219 ± 0.03	C. L. Kegley, H. E. Duckworth, <u>Phys. Rev.</u> <u>83</u> , 229(A)(1951).	Ba ¹³⁸ - Zr ⁹²	+3.58 ± 0.05	H. E. Duckworth et al., <u>Phys. Rev.</u> <u>83</u> , 1114(1951).
Sr ⁸⁶ - Hf ¹⁷⁸	-7.11 ± 0.04	H. E. Duckworth et al., <u>Phys. Rev.</u> <u>83</u> , 1114(1951).	Ce ¹⁴⁰ - Ge ⁷⁰	+4.25 ± 0.03	G. S. Stanford, H. E. Duck- worth, <u>Phys. Rev.</u> <u>83</u> , 229(A)(1951).
Y ⁸⁹ - Hf ¹⁷⁸	-7.07 ± 0.05		Pr ¹⁴¹ - Ti ⁴⁷	+3.64 ± 0.03	
Zr ⁹⁰ - Hf ¹⁸⁰	-7.70 ± 0.03		Pr ¹⁴¹ - Mo ⁹⁴	+2.54 ± 0.05	
Zr ⁹¹ - W ¹⁸²	-7.45 ± 0.04		Nd ¹⁴⁴ - Ge ⁷²	+4.85 ± 0.07	
Zr ⁹² - Ba ¹³⁸	-3.58 ± 0.05		Nd ¹⁴⁴ - Mo ⁹⁶	+3.66 ± 0.03	
Zr ⁹² - W ¹⁸⁴	-7.53 ± 0.04		Nd ¹⁴⁶ - Ge ⁷³	+4.64 ± 0.08	
Mo ⁹⁴ - Pr ¹⁴¹	-2.54 ± 0.05	G. S. Stanford, H. E. Duckworth, <u>Phys. Rev.</u> <u>83</u> , 229(A)(1951).	Nd ¹⁵⁰ - Mo ¹⁰⁰	+4.09 ± 0.04	
Mo ⁹⁶ - Nd ¹⁴⁴	-3.66 ± 0.03		Hf ¹⁷⁸ - Sr ⁸⁸	+7.11 ± 0.04	
Mo ¹⁰⁰ - Nd ¹⁵⁰	-4.09 ± 0.04		Hf ¹⁸⁰ - Ni ⁶⁰	+8.57 ± 0.03	
Sn ¹¹⁶ - Th ²³²	-9.89 ± 0.03		Hf ¹⁸⁰ - Zr ⁹⁰	+7.70 ± 0.03	
Sn ¹¹⁹ - U ²³⁸	-10.24 ± 0.03		Hf ¹⁷⁸ - Y ⁸⁹	+7.07 ± 0.05	
Te ¹²⁶ - Cu ⁶³	+3.61 ± 0.07		W ¹⁸² - Zr ⁹¹	+7.45 ± 0.04	
Te ¹²⁸ - Zn ⁶⁴	+3.91 ± 0.07		W ¹⁸⁴ - Zr ⁹²	+7.53 ± 0.04	
Te ¹³⁰ - Cu ⁶⁵	+3.98 ± 0.06		Pt ¹⁹⁵ - Te ¹³⁰	+5.45 ± 0.11	
Te ¹³⁰ - Pt ¹⁹⁵	-5.45 ± 0.11		Th ²³² - Fe ⁵⁸	+13.17 ± 0.06	
Xe ¹²⁹ - C ₃ H ₇	-20.15 ± 0.02		Th ²³² - Sn ¹¹⁶	+9.89 ± 0.03	
Xe ¹²⁹ - C ₂ OH ₃	-11.68 ± 0.02		U ²³⁸ - Sn ¹¹⁹	+10.24 ± 0.03	
Xe ¹³² - C ₂ OH ₄	-13.08 ± 0.02				
Xe ¹³² - CO ₂	-4.90 ± 0.02	C. L. Kegley, H. E. Duckworth, <u>Phys. Rev.</u> <u>83</u> , 229(A)(1951).			

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